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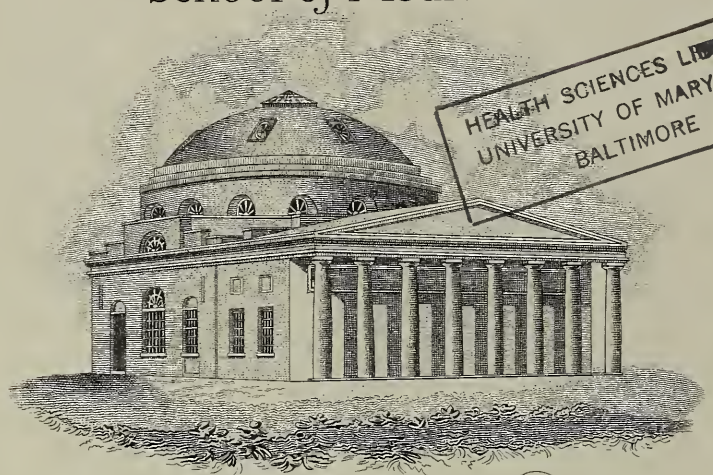

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VOLUME 73 NUMBER 1

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What's New in Thyroid Surgery

WARREN H. COLE, M.D., *Chicago*

ALTHOUGH relatively little new data have been developed during the past several years regarding the etiology of hyperthyroidism, enormous strides have been made in the treatment of the disease. In spite of the great progress made in methods of treatment, controversy still exists as to the preference for types of treatment. Three major types of therapy—(1) subtotal thyroidectomy, (2) antithyroid drugs, and (3) radioactive iodine — are being utilized today. Since favorable results are reported with all three of these different forms of treatment, it is obvious that it will require several more years' study before decision as to which is the best can be reached. However, there is already enough information about all three to suggest that one method of treatment may be superior in a certain group of patients and one of the others superior in another group. It is very probable that the greatest problem in this field during the next few years is going to be to decide the boundary lines of groups of patients in whom one method is better than another.

DIAGNOSIS OF HYPERTHYROIDISM

The diagnosis of hyperthyroidism is really outside the limits of this presentation. However, since differential diagnosis is so important in deciding whether or not specific therapy is necessary, it may be well to comment on two or three important points in differential diagnosis of the doubtful cases. In the first place, administration of Lugol's solution over a period of several days is of extreme value in establishing the diagnosis in doubtful cases, insofar as the drug produces a sharp improvement in symptoms within six to ten days if the manifestations are produced by hyperthyroidism. During the past two or three years it has been shown by several workers that the administration of radioactive iodine may be very helpful in establishing a diagnosis, but unfortunately there is a great variation in methods reported. In the method reported by Werner and associates[10] a dose between 40 and 100 microcuries is given to the patient and radioactivity in the thyroid measured with a Geiger counter, placed at a standard distance of 15 cm. from the neck, with the isthmus of the thyroid identified as the center of the field. The measurements are taken at the end of 24 hours. These investigators studied 57 patients with euthyroidism. The radioiodine uptake by the thyroid at the end of 24 hours ranged between 7 and 49 per cent of the tracer dose given. In this group 91 per cent of the patients had thyroid uptake below 35 per cent. The same investigators studied uptake in 97 patients with hyperthyroidism. In 94 per cent of this group the uptake exceeded 35 per cent. It is very significant that in a series of 21 patients studied following thyroidectomy with good results and return of basal metabolic rate to normal, 38 per cent showed uptake above 35 per cent. In 44 patients with nontoxic diffuse or nodular goiter, the uptake was the same as in the normal individuals. In acute thyroiditis the uptake was low, but in chronic thyroiditis it was low in only one of the 17 patients in whom the test was performed. In carcinoma of the thyroid the uptake was normal in the nine patients studied.

Studies on the amount of protein-bound iodine following ingestion of radioactive iodine for diagnostic study will add to the accuracy of the test. For example, 24 hours after ingestion of radioactive iodine, McConahey and associates[6] found that 75 per cent or more of the iodine was present in the protein-bound form in hyperthyroid patients. In euthyroid persons, the iodine 24 hours after ingestion was found in the protein-bound form in quan-

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Guest speaker's address. Presented before the Third General Meeting as part of the Panel Discussion on What's New in Medicine at the 79th Annual Meeting of the California Medical Association, San Diego, April 30-May 3, 1950.

tities less than 45 per cent. In one patient with myxedema, the amount of protein-bound iodine found 24 hours after ingestion of radioiodine was too small to be measured.

TREATMENT BY THYROIDECTOMY

Cattell[2] of Boston has adequately summarized the results with subtotal thyroidectomy. In reporting on a study of 1,630 patients observed between 1943 and 1949 at Lahey Clinic, he noted that relief of symptoms was obtained permanently in 90 to 95 per cent of patients. The operative mortality rate in this group of patients was 0.24 per cent. In a closer analysis of the first 1,000 consecutive patients in this series, he noted that postoperative complications were encountered with an incidence indicated in Table 1.

TABLE 1.—*Surgical Treatment of Hyperthyroidism*
SUMMARY—1,000 CONSECUTIVE PATIENTS
(After Cattell, in Tr. Amer. Goiter Assn., 1949)

	Per cent	
Hemorrhage	2.7	
Tracheotomy	1.3	
Postoperative hypothyroidism	4.5	
		8.5
Tetany	1.5	
Nerve injury	1.0	
Recurrence	2.4	
Mortality	0.2	
		5.1

In the series reported by Cattell, all patients were prepared preoperatively with one of the antithyroid drugs, most recently propylthiouracil.

There is not total agreement regarding the use of these drugs supplementing surgical therapy. However, it is the author's opinion that preparation of patients with propylthiouracil before thyroidectomy will result in a much lower mortality rate. It is his custom to treat all patients with hyperthyroidism with propylthiouracil. As will be discussed later, a small number of this group, including those with small glands, symptoms of recent origin, and those with mild toxicity, have been treated for a long period of time in the hope that permanent remission might be obtained with medical treatment. Propylthiouracil is given until the patient's basal metabolic rate approaches normal. In that group in which resort to thyroidectomy has been decided upon, Lugol's solution is then started. After 12 to 15 days of treatment with Lugol's solution, the propylthiouracil is discontinued. Four to six days later operation is performed.

All surgeons agree that treatment with antithyroid drugs increases vascularity of the gland, although this increase in vascularity is disturbing to the surgeon in only a small percentage of cases. Preliminary ligation of the inferior thyroid artery (i.e., at the time of operation), as practiced by many surgeons, will prevent significant bleeding. In the author's opinion, utilization of propylthiouracil in preparation of patients for thyroidectomy will lower the mortality rate following operation. Because of the low mortality rate following thyroidectomy, it will take a very large series of cases to prove this point. In over 1,000 patients having thyroidectomy during the ten-year period between 1936 and 1946 at Illinois Research Hospital, the mortality rate was slightly less than 1 per cent. However, during the past three to four years when antithyroid drugs have been used in preparing patients for thyroidectomy there have been no postoperative fatalities in perhaps 300 thyroidectomies.

TREATMENT WITH ANTITHYROID DRUGS

In an attempt to obtain thorough evaluation of the antithyroid drugs, Astwood[1] has adopted the principle of using this method to the exclusion of others. Although propylthiouracil is the drug of choice, Astwood reports fairly effective results following the use of methylthiouracil and mercaptoimidiazole. During the past few months the present author in association with Fowler and Heidenreich has used another drug, iodothiouracil, in about 25 patients. Utilizing the dose of 150 mg. daily, as originally suggested for this drug, satisfactory results in reduction of hyperthyroidism were obtained in no more than 50 per cent of patients. However, with twice or thrice that dose fairly effective results have been obtained, although as yet no advantage of this drug over propylthiouracil has come to light. It was thought originally that this drug might have a more rapid effect than the other antithyroid drugs.

In an analysis of 300 patients given propylthiouracil over a four-year period, Astwood noted that with the dosage of 150 mg. a day about 20 per cent of patients did not respond properly. However, when this dose was increased to 300 mg. a day, response was satisfactory in all but 4 per cent. The present author, as well as others, has had the same experience, namely that with proper dosage of propylthiouracil very few patients will fail to be relieved of hyperthyroidism. As to patients treated with propylthiouracil as a major form of treatment, Astwood reports that detailed data are available on 137 who were treated for a prolonged period of time. Of this group 62 per cent obtained permanent remission, which at the time of his report was of six months' to three years' duration. If the patient is going to have a recurrence of hyperthyroidism following cessation of the drug therapy, symptoms usually will be shown within two months. With the increasing passage of time beyond this period with freedom from symptoms, there is a decreased incidence of relapses. However, patients may be free from symptoms for as long as two to three years and then have recurrence of symptoms.

At Illinois Research Hospital a small group of patients with symptoms of short duration or with small glands or with mild symptoms of antithyroid therapy alone was studied. These patients were treated for six to eight months with the drug before therapy was stopped, and 35 to 40 per cent of them

had remission. However, this represents a picked group of patients and these figures cannot be looked upon as an index of the effect of the drug in all patients with hyperthyroidism.

TREATMENT WITH RADIOIODINE

Soley[8] in an article published in 1949 analyzed results of the use of radioactive iodine in 288 patients with hyperthyroidism in numerous clinics throughout the country. One of the greatest difficulties in the use of radioactive iodine is in the inability to establish a given dose for the patient. It is well known that in general the amount of iodine required is related to the weight of the gland. After experimenting with doses of various sizes, most workers have found that a dose of 100 micrograms of radioiodine per gram of thyroid tissue will eliminate hyperthyroidism in the majority of patients. However, Soley reported that the reaction was quite inconsistent in that some patients were relieved of symptoms with as little as 23 micrograms of radioiodine per gram of thyroid tissue, whereas others required as much as 575 micrograms. In the series analyzed, at least two patients became myxedematous with less than 50 micrograms per gram of thyroid tissue.

In the series of cases analyzed by Soley, the estimated average weight of the thyroid before treatment was 43 gm. After treatment, the weight of the thyroid was estimated at 20 gm. The average time required for the return of the basal metabolic rate to normal was slightly less than five months. A major complication was postoperative hypothyroidism or frank myxedema, which occurred in 8.5 per cent of patients.

In the 288 patients treated with radioiodine there were five deaths, which is approximately the same mortality rate as occurs in subtotal thyroidectomy. It might be said that it is unfair to attribute deaths in this series to the therapy, since two of these patients died of myocardial infarction, two died of vascular accidents of the brain and one died of cardiac failure. It might likewise be stated that at present practically all postoperative deaths following thyroidectomy are of the same type, namely cardiac or apoplectic. Accordingly the mortality rate largely relates to the normal death rate occurring over the period when therapy is being undertaken. Under such circumstances the figures would be unfair to treatment with radioiodine, since the patients being treated are observed over a period of four to six months, whereas patients after operation are held in the hospital no longer than six to ten days.

Of the 288 cases studied by Soley, results were good in 83 per cent and fair in 9.7 per cent. In 5.5 per cent, failure was reported.

Werner and associates[10] also noted that the initial dose of radioiodine is adequate in only about two-thirds of patients. They called attention to the fear expressed by many investigators that carcinoma might develop in these glands years later. The basis for this fear is related to the fact that radio-autography shows an irregular collection of iodine in the glands. If iodine is concentrated in certain areas of the gland, it is conceivable that damage leading to anaplastic changes might take place. It would appear that 15 or 20 years might be required for this transformation. Accordingly, many workers have reserved treatment with radioiodine for patients in the older age groups.

The treatment with radioiodine might be summarized by saying that the drug is effective alone in hyperthyroidism, but that the dose required is inconsistent. Because of the slight danger of production of anaplastic changes years after therapy, it would presumably be desirable, for the present, to confine use of the drug to people in the later decades of life. There appears to be strong indication for its use in recurrent hyperthyroidism following thyroidectomy since the drug will be effective in 90 per cent of such cases, whereas a second operation is effective in little more than 50 per cent of patients with recurrence. Patients with parathyroid deficiency or recurrent laryngeal nerve damage would likewise be good candidates for radioiodine therapy rather than operation. Opinions differ as to the preference in elderly people with cardiac failure. In general, toxic nodular goiter should not be treated with radioiodine except in the circumstances previously mentioned.

CARCINOMA OF THE THYROID

There is considerable difference of opinion as to the incidence of carcinoma of the thyroid, largely because of the difficulty in making a diagnosis from the microscopic slide and because of the great variation in the degree of malignancy. There is no doubt that several years ago the diagnosis of carcinoma was made too often. It is barely possible that the extreme caution in diagnosis urged by pathologists throughout the country during the past few years has swung the pendulum to the other side, and that now the diagnosis is not made often enough. For example, a patient recently admitted to the Illinois Research Hospital had had thyroidectomy 20 years previously, with a diagnosis of nontoxic nodular goiter. There was a nodule in the anterior portion of the neck which, upon histologic examination, turned out to be carcinoma of the thyroid. Further exploration revealed metastatic nodules in the left side of the neck occupying the region from which the thyroid lobe had been removed. There was actually no remnant of the thyroid lobe left on this side, indicating that the tumor could not have been a new tumor of recent origin. This prolonged survival is not unique; investigators have observed many patients for years with metastases changing very little over the course of several years.

The controversy regarding the exact origin of aberrant goiter has been crystallized considerably during the last few years. It is now fairly well agreed that aberrant thyroid nodules are in reality metastatic lymph nodes. It has been shown by many workers that if the ipsilateral thyroid lobe is removed and examined carefully by serial section, the primary lesion can be found with practically no ex-

ceptions. The degree of malignancy in aberrant goiter is actually less pronounced than in the usual type of carcinoma of the thyroid, as has been emphasized by Ward[9] and others.

As has already been indicated, considerable difference of opinion exists relative to the incidence of carcinoma of the thyroid. In some studies conducted at the Illinois Research Hospital six years ago, Cole and associates[3] noted that carcinoma was present in 17.1 per cent of their patients having thyroidectomy for nontoxic nodular goiter. This figure appeared remarkably high, but this was perhaps the first time that the incidence of carcinoma was studied in relation to the various types of goiter. In that series the percentage of carcinoma in toxic nodular goiter was only 1.2 per cent, and in toxic diffuse goiter it was only 0.2 per cent. Since that series was small, the author again reviewed his case records in 1948, but found approximately the same incidence (namely 17.2 per cent) of carcinoma in nontoxic nodular goiter (see Table 2).

Table 3 illustrates the incidence of carcinoma in various types of goiter, as obtained from reports in the literature. In addition to the figures shown in Table 3, Cope and associates have reported an incidence of 10 per cent carcinoma in all nodular goiter, and 19 per cent in goiters consisting of single nodules. Accordingly, it appears than when detailed studied are made of a large series of patients operated upon for goiter, a high incidence of carcinoma is found in patients with nontoxic nodular goiter. It is appreciated by all workers that nontoxic nodular goiter in children is associated with perhaps a still higher incidence of carcinoma, varying between 20 and 40 per cent in different localities.

It is perhaps true that carcinoma of the thyroid is, to some extent, a geographic disease insofar as goiter itself is a geographic disease. The exact role of geography is not fully understood in the incidence of carcinoma.

TREATMENT OF CARCINOMA

Although controversy likewise exists as to the treatment of carcinoma, during the past few years certain points have crystallized from the mass of indeterminate data. Some of the difficulty in arriving at an opinion as to the best form of treatment lies in the fact that so many different types of therapy are available and are being used. For example, carcinoma of the thyroid is being treated by (1) subtotal thyroidectomy, (2) total thyroidectomy, (3) radical resection of the neck, (4) x-ray therapy, (5) radium therapy (radon seeds), and (6) radioactive iodine. Most workers will agree that the tumor should be removed if possible, largely because it has now been demonstrated that carcinoma of the thyroid will take up significant quantities of radioactive iodine in only about 10 per cent of cases. The treatment of metastatic carcinoma of the thyroid with radioactive iodine has been discouraging but has received renewed support by Rawson and associates,[7] who discovered that total destruction of the thyroid increases the uptake of radioiodine by the metastatic nodules. For example, in eight of 13 cases of adenocarcinoma, the tumor assumed the capacity to concentrate radioactive iodine after the thyroid was removed. The time required for these changes to take place varied between one and 32 months. In one case in which the patient had a solid adenocarcinoma, a metastatic tumor which did not take up iodine even after development of myxedema, was found to concentrate iodine after the patient was given thyroid-stimulating hormone (Armour's thyrotropic hormone). In four

TABLE 2.—*Incidence of Carcinoma in Nodular Goiter (Including Toxic, Nontoxic and Carcinoma) at the Illinois Research Hospital 1936-1948*

(After Cole and Associates, Tr. Amer. Goiter Assoc., 1949)

Type of goiter	1936-1944 No. of Cases	1936-1944 % Carcinoma	1944-1948 No. of Cases	1944-1948 % Carcinoma	1936-1948 No. of Cases	1936-1948 % Carcinoma
Toxic nodular	330	1.2	48	0	378	1.0
Solitary	(71)	0.0	(17)	0	(88)	0.0
Multinodular	(259)	1.6	(31)	0	(290)	1.4
Nontoxic nodular	192	17.1	93	17.2	285	17.15
Solitary	(92)	(24.0)	(51)	(25.5)	(143)	(24.4)
Multinodular	(100)	(11.0)	(42)	(7.1)	(142)	(9.8)
Total	522	7.2	141	11.3	663	8.0

TABLE 3.—*Incidence of Carcinoma in Nodular Goiter as Obtained from Numerous Reports in the Literature*

(After Cole and Associates, Tr. Amer. Goiter Assoc., 1949)

Author	No. of Patients with Nod. Goiter (Toxic and Nontoxic)	Per Cent Carcinoma in Nod. Goiter (Toxic and Nontoxic)	No. of Patients with Nod. Nontoxic Goiter	Per Cent Carcinoma in Nod. Nontoxic Goiter	Per Cent Carcinoma in Solitary Nontoxic Nodular Goiter
Brenzier & McKnight (6); Charlotte, N. C., 1940	2,324	4	.....	.....	.....
Horn & Assoc. (7); Philadelphia, Pa., 1947	1,135	6.3	637	9.8	.....
Crile: Cleveland, Ohio, 1948	537	5.6	274	10.9	24.5
Ward: San Francisco, 1947	3,539	4.8	.....	.....	15.6
Cole & Assoc.: Chicago, Ill., 1948	663	8.0	285	17.1	24.4

patients with papillary adenocarcinoma, Rawson and associates found no increase in concentration of iodine in the metastatic lesions after removal or destruction of the thyroid lobe. However, since surgical removal or destruction of the thyroid with radioactive iodine is fairly effective in increasing the uptake of iodine by the metastatic nodules in a large percentage of patients, it appears that this procedure should be resorted to in every operable case. The only point of indecision will lie in whether the remaining thyroid should be removed surgically or destroyed with radioactive iodine. At present there is no consensus on that point although there might be some advantages to surgical removal.

As stated previously, there is a difference of opinion regarding the type of operation to be performed for carcinoma of the thyroid although most workers will agree that the tumor should be removed if possible and perhaps treatment given later with radioactive iodine and/or x-ray therapy. Some surgeons are of the opinion that if the tumor is small and located deep within the body of the thyroid lobe, subtotal thyroidectomy may be sufficient. However, as more experience accumulates with carcinoma of the thyroid, the author is inclined to be more and more radical. For example, during a subtotal thyroidectomy eight years ago, a small tumor was found deep in the body of one lobe. After considerable debate at the time, it was decided not to remove the entire lobe, although the amount of tissue left in place was no more than 3 gm. on the posterior capsule. However, a few months ago the patient returned with a large recurrence in the remnant of the thyroid and numerous metastatic nodules including invasion into the jugular vein. Of course it must be admitted that this recurrence might have taken place even though a total thyroidectomy on that side with a radical excision had been done. The case of another patient, previously referred to in this presentation, may illustrate the advisability of radical resection. Thyroidectomy had been done 20 years previously and on admission to the Illinois Research Hospital a few months ago the patient had a mass in the anterior portion of the neck which proved to be carcinoma. Further exploration revealed several metastatic nodules in the left side of the neck, but no remnant of thyroid tissue. It is apparent that 20 years ago the surgeon removed the right lobe completely. Again, it cannot be said whether or not radical resection would have cured this patient. However, since radical resection for carcinoma of other organs has been accepted without question, it would appear to the author that the same philosophy should be applied in carcinoma of the thyroid gland.

Perhaps this preference for radical therapy has been influenced by the fact that of 16 patients with carcinoma of the thyroid observed by the author during the past four years, 11 are already dead. It should be stated, however, that in about one-half of the 16 cases the lesions were inoperable when the patients were first observed.

THYROIDITIS

Acute thyroiditis. The need for surgical treatment of this condition is dependent upon the causative factor, as indicated by whether suppuration does or does not develop. In practically all cases in which there is suppuration the disease is pyogenic (streptococcus or staphylococcus, more commonly the former). In the author's opinion, at least some of the cases not proceeding to suppuration are viral in origin. This statement is based on the fact that a large percentage of patients with acute nonsuppurative thyroiditis give a history of having had upper respiratory infection a few days before thyroiditis developed; it is fairly well agreed that many of these respiratory infections are viral in origin. Nonsuppurative thyroiditis runs its course within a few weeks and, with the exception of a few of the more severe cases, all symptoms subside within that time. In general, no therapy has been of significant value in such cases, although some clinicians have gained the impression that thiouracil compounds hasten recovery. Certainly operation is not indicated. On the other hand, surgical incision of the fluctuant area is indicated in treatment of suppurative thyroiditis.

Chronic thyroiditis (Hashimoto's disease and Riedel's disease.) The cause of these two lesions is still more obscure than that of acute thyroiditis. However, a fair amount of evidence is available to the effect that infection is not the cause in either of the two. One point is fairly certain, namely, that acute thyroiditis is not followed by chronic thyroiditis of the types just referred to. A few workers have suggested that Hashimoto's disease is an early stage of Riedel's disease, but during the last two or three years there has appeared to be a growing conviction that the two lesions do not represent stages in the same process, but are two separate entities. The fact that Hashimoto's disease is always bilateral and Riedel's disease commonly unilateral supports the idea that the former cannot be the precursor of the latter.

Hashimoto's disease. Although it is fairly well agreed that thyroidectomy should be done in treating this disease, there is no agreement as to how much thyroid should be removed. This indecision is accentuated somewhat by the fact that at times the disease is accompanied by mild hyperthyroidism at the onset. Unfortunately the diagnosis of Hashimoto's disease can rarely be made clinically. Often, indeed, the diagnosis is not made until the tissue is examined microscopically. Davison and Letton[5] noted that following total thyroidectomy mild myxedema developed in 61.5 per cent of 28 patients observed by them. Hypothyroidism occurred in 89 per cent of the total number of cases. Obviously, total thyroidectomy should give rise to a high incidence of hypothyroidism. Some workers believe that Hashimoto's disease is best treated by x-ray therapy, particularly since the incidence of hypothyroidism will be lower with this treatment than after total thyroidectomy. It is barely possible that if a way to select the patients were known, thyroidectomy

might not be necessary in a certain percentage of cases. However, when symptoms of hyperthyroidism are present or when compression symptoms are significant, either subtotal thyroidectomy or irradiation would appear to be strongly indicated.

Riedel's disease. As in the late stages of Hashimoto's disease, hypothyroidism is usually present in woody thyroiditis or Riedel's disease. The gland in this condition is so firm that it is readily confused with carcinoma. One important aid in differentiation is the fact that in carcinoma the basal metabolic rate is usually normal or slightly elevated, whereas in Riedel's disease it is usually below normal, particularly in the latter stages when induration is pronounced. Another point of differential value lies in the fact that if nodes are palpable alongside the thyroid, the diagnosis of carcinoma can usually be made safely, since nodes are seldom involved in Riedel's disease.

Theoretically, removal of the thyroid gland in this condition would be undesirable since it might increase the hypothyroidism. However, there is fairly strong evidence that the thyroid in Riedel's disease is exerting little or none of the function ascribed to the normal thyroid gland.

Since symptoms of compression are so common in woody thyroiditis, thyroidectomy is usually advisable. However, there is little or no justification for attempting to be radical in removing the lobes, particularly since adhesions are frequently so dense and landmarks so obscured that even subtotal resection would seem dangerous to vital structures, the laryngeal nerves in particular. Moreover, it has been discovered that removal of the isthmus and the anterior portion of the thyroid on each side (if both sides are involved) is sufficient to eliminate the compression symptoms.

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What's New in Cardiovascular Surgery

FRANK GERBODE, M.D., *San Francisco*

SUMMARY

Advances in the treatment of congenital cardiovascular lesions have led to a renewed interest in the treatment of acquired heart disease. Although this field could best be served by the perfection of the extracorporal heart, such devices are as yet not ready for human application. Meanwhile, various approaches through the ventricles and left atrium have been developed to treat valvular stenosis. Refinements in diagnostic tests and in methods of physiological investigation are of great aid in the proper evaluation of patients.

NOT long ago, Claude Beck, a pioneer in cardiac surgery, wrote: "Indeed, the time is not far off when operations upon the heart will be almost as common as operations upon the vermiform appendix."[3] This prediction has already been realized in some clinics. Furthermore, it is no longer an unusual circumstance to hear the heart discussed as an organ subject to surgical correction. This attitude has developed as a consequence of advances in the treatment of congenital cardiovascular malformations, which, in turn, stimulated a renewed interest in the development of techniques for the treatment of acquired heart disease.

The correct diagnosis and the proper evaluation of the abnormal function of the heart and great vessels at times is quite difficult. Physiologic investigations such as the measurement of the oxygen saturation of the blood in various parts of the vascular system, cardiac catheterization, angiocardiography, exercise tests, and electrocardiography are required. Above all, teamwork is essential in cardiovascular surgery, and the degree of success attained is dependent upon the combined skill and effort of all those involved in the diagnosis and treatment of these patients.

PATENT DUCTUS ARTERIOSUS

Since the first successful closure of a patent ductus arteriosus by Gross in 1938, the operation has had widespread acceptance. There is general agreement among cardiologists that a ductus which remains patent beyond the age of two or three should be closed, for the hazards of the ductus are greater than those of operative intervention.

The method of closing the ductus is not agreed upon by all cardiovascular surgeons. Thus Scott,[45] in reporting upon 180 patients operated upon at Johns Hopkins Hospital with five deaths and one recanalization, advocated the suture-ligature method of Blalock as being safer than division and suture. On the other hand, Gross,[26] Wangensteen,[52] and Potts[44] advocate division and suture. Jones,[36] in analyzing his experiences with 125 patients, gave a lucid description of the possible complication of the operation. There were four deaths in the series, and Jones concluded that there is not a "single, universally ideal technique" for the operative treatment of the ductus.

The author uses ligation more frequently than division. It is felt that if the ductus has been thoroughly mobilized so that it is possible to allow a space between the two or three braided silk ligatures there is little chance of recanalization.

CYANOTIC HEART DISEASE

The brilliant use of an artificial ductus arteriosus for the treatment of tetralogy of Fallot by Blalock and Taussig has been followed by numerous reports of its successful adoption by others.

In general, Blalock prefers not to operate before the age of two if the chances of survival to the age of two are 50 per cent or better.[8] He reported an over-all operative mortality rate of 17.7 per cent, but in those patients who survived a subclavian-to-pulmonary-artery anastomosis the mortality rate was 10.4 per cent. Potts[42] reported upon 181 patients. In most cases aortic-pulmonary artery anastomosis was carried out. The over-all mortality rate was 12.7 per cent, and in those who survived anastomosis it was 9.7 per cent. Paine and Varco,[40] and Holman,[32] advocate using the left subclavian artery in preference to the right subclavian artery.

Although experimental studies on venous shunts for complete transposition of the aorta and the pulmonary artery held some promise of success, the clinical application of these procedures, as reported by Blalock[10] and Hanlon,[29] was not very encouraging. Of the various operations, the best results followed the creation of the combination of an interatrial defect and an extracardiac arterial shunt.

It is not unlikely that certain anomalies of the pulmonary veins, particularly those in which most or all of the veins empty into the right atrium, may be improved by atriovenous shunts.[8, 12] Work in the surgical laboratory at Stanford University School of Medicine has demonstrated the feasibility of shunting large veins to the atrium, whereas small atriovenous shunts usually close by fibrosis.[21, 22] It is probable, therefore, that these procedures will be more successful in the older age groups, after growth of the veins has occurred.

Fell[19] and his associates have reemphasized the

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practicability of the Potts procedure of direct aorta-pulmonary artery anastomosis in the small infant. They used it, with dramatic improvement, in three children with tricuspid atresia all weighing less than ten pounds.

COARCTATION OF THE AORTA

Following the first successful operations for coarctation of the aorta by Crafoord,[16] and Gross,[28] several series of cases have been reported. Gross recently described his experiences with 100 cases.[25] In nine, resection of the aorta was not attempted. There were 11 deaths. Of the 80 patients who survived the completed operation, 71 had total relief of hypertension, and eight had fairly satisfactory relief. The group at Johns Hopkins Hospital have reported upon 23 patients.[5] Thirteen were 21 years of age or above, while 10 were younger. Anastomosis was completed in 21 cases, with three deaths for the whole series. Physiological observations indicated that the hypertension in coarctation probably is not caused by a renal pressor mechanism. A number of interesting associated anomalies have been encountered during these procedures. Shumacher[46] successfully contended with an aneurysm distal to the coarctation. Unilateral hypertension due to involvement of the origin of the left subclavian artery in the area of aortic atresia has been recorded.[20] An associated patent ductus arteriosus is found occasionally. Long segments of atresia which preclude direct end-to-end anastomoses have necessitated the use of preserved homografts,[27] and the left subclavian has also been used to bridge the gap.[33]

CHRONIC CONSTRICTIVE PERICARDITIS

In a recent survey of 265 recorded operations for constrictive pericarditis, Holman[3] found that 21 deaths occurred on the operating table, 48 deaths occurred in the early postoperative period, 118 patients were considered cured, and 44 improved. Pericardiectomy was performed upon nine patients, four of whom had active tuberculous pericarditis. Pronounced improvement was noted in eight cases. One patient died. Holman stressed adequate exposure through a median sternotomy and liberation of all borders of the heart, including both cavae. Experimental work by Parsons and Holman, now being completed, indicates that most of the signs of constrictive pericarditis can be reproduced by interfering with the filling of the right heart through the constriction of the cavae, or the right atrium and ventricle.

Oglesby[39] and his associates reviewed the case histories of 53 patients observed at the Massachusetts General Hospital since 1914. Hydrothorax and calcification of the pericardium occurred in about 50 per cent of the cases. In all, 42 patients were subjected to pericardiectomy; 15 of them were essentially cured, and ten improved. Six patients died from the effects of the operation. From the standpoint of etiology, it is of interest to note that tuberculous involvement was proven in only nine cases.

MYOCARDIAL ISCHEMIA

In a series of publications Beck[2, 4] has reported a new approach to the relief of coronary artery disease. In operations upon dogs, the carotid artery was anastomosed to the coronary sinus in an effort to revascularize the cardiac muscle. The measurement of benefit of the operation was made by ligating the descending ramus of the left coronary artery at its origin. In another group of animals a free vein graft was used between the aorta and the coronary sinus. There were more survivors among the animals which had the protection of the shunt. One patient was operated upon, but a fresh infarct developed and death ensued. This procedure calls for considerable operative skill and leaves unanswered many fundamental physiological questions concerning the flow of blood in the heart muscle. Vineberg[51] explored the possibility of implanting the internal mammary artery into the ventricular wall and found that, under experimental conditions at least, communications with the circulation of the coronary vessels took place.[51]

Carter[13] and his associates have restudied Lezius' method of producing a coronary collateral circulation by means of cardiopneumonopexy. In a series of experimental animals asbestos powder was used to produce vascular adhesions between the lung and the heart, and the effect of coronary artery ligation was observed. The collateral stimulated by the adhesions reduced the mortality and the frequency of severe infarction resulting from coronary ligation. The operation was done on three patients with benefit in two; the other died due to infection. In another experiment, Carter and MacMillan[14] reported their experiences in developing a technique for the excision of portions of the ventricles, and stated that the possible use of such a procedure might include the resection of small aneurysms and foreign bodies, as well as areas of necrotic myocardium which result from acute ischemia.

CONSTRICTIVE VALVULAR DISEASE

In the past few years there has been a great revival of interest in the surgical treatment of constrictive valvular disease. The ultimate goal in cardiac operations for this purpose is the repair of the valves under direct vision, but this must await the development of an extracorporal device which will maintain the circulation while the heart is opened. A number of laboratories are engaged in the perfection of such an artificial heart: Gibbon[23, 24] of Philadelphia, who has labored for years on this problem, has predicted the perfection of his apparatus in the near future; Björk[6] of Sweden, Jongbloed[35] of Holland, and Karlson and Dennis[37] and their associates of Minneapolis have all attained a degree of success with various types of machines. At present this work has reach the point at which medium-sized dogs can be maintained for several hours while the heart is opened.

Meanwhile, valvulotomy is being applied clinically in the treatment of valvular stenosis by a number of surgeons. Smithy[47] and associates used both

ventricular and auricular approaches to the stenotic mitral valve and removed a small segment of anterior cusp by means of a punch type of valvulotome. In a series of seven patients, eight operations were performed with two deaths. In four patients there was clinical improvement, and in one there was little change. Harken[30] prefers the approach through the left auricle and believes that one should strive for a minimum amount of regurgitation and a maximum restoration of valvular function by incision or excision in the zones of the commissures. He and his associates reported operations upon eight patients. There were five valvuloplasties with three deaths, two interatrial septal defects, and one cardiac denervation. Some improvement was noted in those who survived the operations.

Bailey[1] and his associates in Philadelphia have meanwhile developed an ingenious method of performing a valvulotomy through the left auricular appendage in which the index finger is used as a guide to feel the stenotic valve and also to direct a valvulotome to the proper position. They, too, stress cutting the commissures rather than the valve leaflets, believing that valvular action is preserved and regurgitation prevented. They have now done a moderate number of such operations and have reported good clinical improvement and a comparatively low mortality rate.

The observation by Lutembacher that patients with mitral stenosis and an atrial septal defect develop less pulmonary edema led Sweet and Bland[49] to postulate that a vent between the pulmonary venous and systemic venous circulations might prevent the pulmonary edema which occurs under stress in these patients. They performed an anastomosis between the superior segment branch of the inferior pulmonary vein and the azygos vein in six patients and noted pronounced clinical improvement in three.

Several years ago, Rundle and the author attempted to test the physiological effects on pulmonary hypertension of an azygos vein to pulmonary vein shunt in the experimental animal. The investigation was not completed because of lack of a method producing a high degree of mitral stenosis which would result in lasting pulmonary hypertension. It was learned, however, that small vein-to-vein anastomoses frequently thrombose, a result which was no doubt encouraged by the lack of a pressure differential that would ensure a free flow of blood through the shunt.

Patients with pure pulmonic stenosis do not benefit from the creation of an artificial ductus arteriosus, but are improved by transventricular valvulotomy as described by Brock.[11] Blalock and Brock[9] recently reported their experiences with this method. In 19 cases there were two deaths, and considerable improvement was noted in the survivors.

In 19 experiments on dogs Templeton and Gibbon[50] reported the successful replacement of the tricuspid valve for an excised one in seven animals. The operations were performed through the open right atrium. The grafts were made from pericardium and vein, the pericardium proving to be the superior tissue.

The production and repair of interatrial septal defects has been studied in experiments on animals. Hanlon and Blalock developed a method of producing small atrial defects,[29] and have reported their clinical results with its use in the treatment of transposition of the great vessels.[10] The direct approach through the open right atrium, with the cavae occluded, is being used to make large septal defects.[48] Having made openings by this means in a group of animals, Swan and his associates devised a method of invaginating the auricular appendages into the defect, and reported satisfactory closures. They claim an advantage over Cohn's method.[15] Dodrill devised a double ring instrument which clamped the atria, approximating the lateral walls against the septum.[17] This permits excision of a portion of the septum in a bloodless field, through an incision in the outer atrial wall.

Murray[38] has described a method of closing septal defects, which he developed on 30 dogs. It consists essentially of passing sutures through the heart in the line of the interatrial septum and pulling them taut to close the defect. He has reported its use in a few patients, with moderate improvement.

VESSEL GRAFTS

For many years, surgeons have sought a satisfactory method for bridging gaps in blood vessels which have been damaged by disease or trauma. Pioneers in this field 50 years ago were Carrel and Guthrie. With the increase in interest in cardiovascular surgery, the need for grafts has again been emphasized. Gross[27] and his co-workers have demonstrated tissue viability of segments of aorta stored in special media for 35 to 40 days, and have reported excellent early results with the use of experimental and human homografts. Autogenous vein grafts to replace defects in medium-sized arteries continue to be used and appear to function satisfactorily.[34] Donovan[15] found that homogenous vein grafts thrombosed when anastomosed to the heart.

The author has been interested in this problem for a number of years, and, among other things, has found that arterial homografts will conduct blood satisfactorily for long periods of time. However, pronounced degenerative changes frequently occur in the vessel wall soon after transplantation, and ultimately the graft is replaced by fibrous tissue, with very little retention of normal aortic wall structure.[41] Fatty changes and calcium deposition were a frequent finding in the grafts.

These results call attention to the fact that the immunological and other factors concerned in maintaining viability of the transplanted tissue in the host must be understood before the ultimate goal in surgery—the replacement of a diseased organ with one that is healthy—can be achieved.

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What's New in Isotopes, 1950

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FOR many years the clinicians who came to me for radiologic consultation used to talk over the new advances in medical science and so keep me down to date. I always claimed that this was very nice—my friends did my reading for me. Now that I am permitted to channel my attention into the newly blossoming field of radiobiology, I am glad to undertake to do my friends' reading for them. Though the spirit is willing, yet the flesh is weak, and I find myself always behind in my reading. Moreover I am by nature intellectually excitable and readily led away on what smells like a hot trail of new development or new ideas, which may not be after all the game I am supposed to be pursuing.

I take my present assignment to be: Radioactive Isotopes in New Developments for Medicine. I shall therefore restrain myself in regard to bevatrons, linear accelerators, cosmic noise, pi and mu mesons, radioastronomy, roentgencinematography, cancer therapy by arterial injection of mustard, and the stone-in-the-anemone* method of treatment of infections and neoplastic diseases. But I might stop to mention the two new elements.

Uranium is the heaviest of the natural elements. Transuranic elements have been made by nuclear bombardment. Shall we call them "invented" rather than "discovered"? Neptunium and plutonium were made in developing the atomic bomb. By proper bombardment of these, americium and curium were made. Now two more, namely berkelium (55) and californium, have been reported. These have been made in only invisible amounts but are known by their chemical reactions. They are unstable, with half lives of 4.8 hr. and 45 min. respectively. This brings the number of known elements to 98. Prediction[64] has been ventured that elements No. 99 and 100 can exist (in their isotopes of mass 251 and 254, respectively).

The newest news in isotopes is of course the hydrogen bomb (fusion bomb), which is so new that it is not made yet[9] and maybe not possible. I will be glad to bend your ears on this subject for a couple of solid hours any time you will listen, but may not do it now. I can only express a present conviction that I do not momentarily apprehend destruction of all mankind by loosing upon the world radioactivity so enormous as to be lethal everywhere. I do think atomic warfare so bad that it ought to be given up and that statesmen ought to give first place to this problem, beside which all other problems are unimportant distractions. There is no adequate defense (except political) against even the present atom bomb, and only the most unsatisfactory therapy for radiation wounds. The Federal Government has begun general education about the A-bomb.[3]

TREATMENT OF TOTAL BODY IRRADIATION

The LD 50 of x-ray or gamma ray for man is not known precisely. It lies somewhere about 400 r. From experiments on mammals one learns: Strenuous exercise increases the lethality of total body irradiation.[35] Cysteine and other innocuous sulfhydryl compounds[44] may reduce mortality by half, if given before the irradiation; NaCN likewise.[28] Bone marrow proliferating actively (after hemorrhage, for example) is less injured by irradiation than when in a quiet state.[10] This goes against the radiologists' generalization that dividing cells are more radiosensitive. The spleen is able to pinch-hit for hematopoiesis[30] after destruction of bone marrow, and spleen and appendix are able to carry on for humoral immunity reactions[29] after destruction of the lymph nodes. Should we all take to wearing gamma-ray armor over the spleen? Blood transfusions are effective in reducing irradiation death rate. But one does not see how one is to get 20 transfusions apiece for hundreds of victims after an A-bomb blast.

CATARACTS

It has long been known that irradiation of the eye can produce cataract. The dose necessary may be as small as 600 r. Lately there has been report of a couple of cases of cataract developing in scientists working with a cyclotron.[1] The supposition is that these were induced by neutron rays. A number of cataracts have developed in the Japanese A-bomb victims.[14]

BETA RAY BURNS

At the most recent A-bomb tests (Eniwetok, 1948), several scientists foolishly handled material that had just been flown through the column of smoke from the bomb. The beta irradiation on their hands was extremely high. It is noteworthy that when sufficiently intense, beta radiation is palpable. The injuries were severe.[36]

INDUSTRIAL USES OF ATOMIC POWER

Power plants using uranium instead of coal for fuel are not yet here. We are warned that even if the energy were to be had for nothing, the power would still have to be distributed, and these distribution costs are several times the cost of present fuels.[23] Atomic (nuclear power) engines will never be small enough to run an automobile. It is open

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* In Kingsley's "Water Babies," Tom, being still a bad little boy, drops stones into sea anemones to fool them into thinking a meal has come their way. Our present concept of sulfa drugs is that they imitate a related compound and take its place in cellular chemistry, but then prove misfits in the chain of essential vital reactions. Similarly the folic acid deviates for treating leukemia, and now more recently a purine deviate, guanazolo, for cancer (unhappily not successful).

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knowledge that we are trying to develop nuclear energy for propulsion of aircraft (Fairchild Corp.) and of ships including submarines (General Electric Corp. and Westinghouse Corp.), but the projects themselves are secret, of course.[23]

MEDICAL AND BIOLOGICAL RESEARCH

Research in biological fields, applicable to medical problems, continues ever more actively along some of the older lines. One gets an idea by counting reports in *Nuclear Science Abstracts*. There are three or four reports per month on I^{131} for thyroid therapy, but the number of reports on its use for thyroid physiology recently has been more than double the previous six per month. Of 245 institutions getting radioactive isotopes from Oak Ridge for medical and biologic researches,[2] 167 are using I^{131}. As to P^{32} there has been no acceleration in the publication of reports—one per month on therapeutic uses, six per month on tracer uses.

P^{32} has this year been released for clinical use in treating polycythemia and leukemia. Presumably a physician may now look on it as applicable to the patient's interest. One still has to get it through an isotope committee in an institution.

It is still not demonstrated that P^{32} is superior on the whole to x-ray for management of leukemia. For polycythemia some would call it the treatment of choice. Lawrence[37] reports 172 cases, of which 121 were treated with P^{32}, with preservation of normal life expectancy.

More and more patients are being reported treated with I^{131} for Graves' disease and for thyroid cancer. One is hardly yet ready to abandon the old position, namely that the treatment of choice for hyperthyroidism is thyroidectomy.[34] One's estimate of what is best in given cases is undoubtedly going to be altered as experience perfects the clinical art of handling hyperthyroid patients with I^{131}.[60]

A number of cases of thyroid cancer with metastases are being reported held in check with I^{131} in large doses. The percentage of thyroid cancer cases amenable to such therapy remains small (about 10 per cent).[21] Some thyroid cancers that have taken up little or no I^{131} can be converted into iodine acceptors by (a) thyroidectomy[57] (probably a wise move early in the management of such a case), (b) thyrotropic hormone (30 mg. a day has been advised), (c) propylthiouracil (uptake bounces up to more than original level within a couple days of cessation of this drug),[62] (d) prolonged high-level water diuresis.[56]

NEW ATOMIC INSTRUMENTS

The instrument makers have been really busy and the apparatus available for the techniques of research with radioactive isotopes are ingenious and good. A new technique which is very promising is developed from an old one. I refer to scintillation counting, where one uses a fluorescent crystal and counts the flashes of light instead of measuring the total brightness of the glow. The first radium toy was the spinthariscope, in which alpha particles from a speck of radium produced tiny flashes of light in a zinc sulfide screen. This was the method used by Rutherford in his pioneering experiments on nuclear transmutations. Now this old technique has developed into the newest, and for some purposes promises to displace the Geiger counter. The physicists are doing new tricks with scintillation counters[33] because they are so much quicker than a Geiger counter (counting rates of a million per second), and because they are more efficient for gamma rays.

There are a number of refinements in the way of increased convenience: Machines that change samples automatically and print the measured activity of each, so that one can set one going in the evening and come back next morning to find two dozen specimens all measured; circuits to measure and record changing values of radioactivity over a period of time; circuits that calculate the counts per minute and show the value on a dial; machines to do chemical manipulations behind a lead barrier by remote control. These are nice to know about but are really pertinent only to the isotopic researcher, not to the practicing physician. The development of so-called nuclear emulsions, which have proved such a marvelous tool for the physicists in their researches on mesons, etc., in cosmic rays and from the big cyclotron, have increased the resolution of radioautographs until one can begin to see which cell in a tissue holds the radioactivity. Beta rays are least efficient at ionizing when of highest energy and produce lots of ions only after they have slowed down, which means when they are far from the source. Looking at the developed film, therefore, one cannot tell very precisely what was the point of origin. But some of the new emulsions will show tracks of beta rays even up to ¼ mev., which more than covers the energy of such biologically important tracers as carbon[11] and sulfur.

One new instrument worth mentioning is the strontium beta ray applicator for ophthalmic treatments. This is really not a new technique, for radium beta rays have been used for superficial therapy for half a century. An ophthalmic applicator using radium D has been on the market for years. The advantage of the new one is that radiostrontium (separated from fission products) is less costly, so that one may have an activity high enough to reduce the therapeutic applications to a fraction of a minute.

After waiting for more than a year, we see at last two manufacturers offering very narrow Geiger tubes designed to explore the living brain after administration of P^{32} to mark a tumor for the surgeon's guidance.[48]

Radiogallium has been shown to go rapidly to bone.[18] It is a beta emitter of fairly short half-life (14 hours). One fears to recommend any clinical trial of this for treatment of malignant tumors in the bones, because of the way radiostrontium actually produces malignant bone tumors. It seems unlikely that the difference in their half-lives will be very important if they be given in amounts to give comparable total dosage.

Radiocobalt (Co^{60}) is being made available in larger quantities and at much reduced price ($5 per curie after the first two curies). It can be produced in specific activity of several curies per gram in an old Oak Ridge pile. Newer pile design will undoubtedly make higher neutron fluxes available than the present 10^{12} n/cm^2 sec., with consequent raising of the specific activity attainable. This has induced a number of workers to draw plans for cobalt irradiators designed to use several hundred curies.[15] Such a source would be usable at much greater distance (between source and patient) than the radium "cannons" at present available. It would be more nearly comparable to a 2-million-volt x-ray tube. The lead shielding would be very heavy (half a ton or more), leading to severe engineering problems. Much weight could be saved by using a denser material than lead, such as gold or uranium. Gold is much too costly ($500 a pound, avoirdupois), and not to be rented from the Federal burial ground at Ft. Knox. Uranium has recently been released for open sale, but only 300 pounds of it, and the price quoted for the metal is $50 a pound. Dense alloys of tungsten are on the market at $10 a pound. A cobalt cannon has actually been built in England, but none as yet in this country.

Intracavitary treatment with a solution of Co^{60} inside a rubber bag has been suggested.[41] Substitution of Co^{60} for radium tubes and needles in present techniques is obviously promising.

That about ends all that is newly promising in therapy. One returns to the conviction that revolutions in medical practice may come from isotopes, but it will be through their use as research tools for making discoveries in the basic medical sciences.

TRACERS

Looking through *Nuclear Science Abstracts* one sees an increasing number of reports of tracer applications to biology—20 per month a year ago, 25 per month six months ago and 55 per month the first quarter of 1950. The variety reported is large and it is not to be expected that I can understand them all, nor that I can evaluate the importance of each and pick out for you what is most promising of the new discoveries and novel methods of attack. I shall talk about only a few, choosing those that seem scientifically curious or exciting. Another commentator might make quite different choices.

I^{131} is revealing many features of thyroid physiology: The thyroid takes up iodide, but not thyroxine.[13] In iodine starvation, I^{131} begins to enter the colloid within two minutes, but if a rat is given 22 mg. stable iodine per day the I^{131} stays in the follicle cells for an hour or more before entering the colloid. Hypophysectomy makes it stay in follicular epithelium.[38] In man, a slight increase in serum iodine increases I^{131} uptake in thyroid, but more than 5 or 10 mg. per 100 cc. inhibits it, the lower value being for clinical Graves' disease.[52] Sex hormones, male or female, depress I^{131} uptake (by pituitary depression).[42] Response of I^{131} uptake to thyrotropin can differentiate primary (thyrogenous) from secondary (pituitary) hypothyroidism.[46] Large doses of I^{131} (internal irradiation of thyroid) do not disturb thyroid function within the first ten days. But massive doses are followed by a triphasic reaction, first a release of iodide accompanied by lowering of protein-bound iodine, then a rise of protein-bound iodine (destructive action on follicles with release of colloid), and finally by myxedematous low level of serum iodine.[19] Thiocyanate is bound by thyroid more than by other tissues, but, curiously, propylthiouracil nullifies this.[63] Large doses of I^{131} in mice produce tumors (not neoplastic) of the pituitary (pituitary attempt at compensation?).[24] Epinephrine lowers I^{131} uptake in rats, but if the animals are adrenalectomized, then it increases uptake.[47] (Figure that out!) Measurement of rate of uptake by thyroid may be an improvement over per cent uptake attained, for clinical diagnosis.[43]

P^{32} continues to work hard for the biochemists interested in nucleoproteins. Synthesis of nucleic acids (ribose- and desoxyribose-) and their passage into mitochondria[32] and cytoplasm are readily followed in health, infections, regenerations and neoplasms. These experiments touch on the reproduction of chromosomes and the enzymatic activities that are the foundation of life itself. Nobody knows what revolutionary discoveries may be in the offing here. A phosphatase can transfer a phosphate group from one molecule to another and never let it become contaminated by phosphates in the surrounding solution.[5] Some enzymes have been shown to become contaminated by the substances they are working on.[31] Phosphorus turnover is 50 per cent higher in gastric carcinomas than in adjacent normal mucosa.[25] Will someone turn this to account for clinical diagnosis? By measuring mitotic activity of testicular epithelium, it has been shown that hypophyseal stimulation of testis is inhibited by the pineal.[54] Mosquitoes have been successfully labeled with P^{32} as an aid to control studies.[27]

Carbon 14 is a tracer whose usefulness is as wide as organic chemistry. One firm* offers 59 organic compounds labeled with radiocarbon (@ $100 to $500 a milligram). There is a little C^{14} in the atmosphere due to action of cosmic rays on nitrogen. Old stores of carbon show lesser activities, of course, because the C^{14} decays away (half gone in 5,000 years).[4] This has permitted measurement of the age of Egyptian mummies and confirmation of historical chronology. Some other C^{14} researches are interesting and perhaps important: Fat given by vein is readily metabolized.[22] Arterial wall is able to synthesize fatty acids from acetate.[12] (Has this any meaning for atheroma?) Normal persons break down one-half to three-quarters of dietary fat in the first 24 hours, but this is greatly lessened in hyperlipemic patients.[53] (This was determined with I^{131} as a tracer.) Only a little radiocarbon is retained in the body, but its location and concentration are

* Tracerlab: California office is at 2295 San Pablo Avenue, Berkeley 2, California.

uncertain; therefore it is still considered hazardous for human experimentation.[50]

Hemoglobin has been studied with C^{14} as well as Fe^{55} and Fe^{59}. Carboxyl-labeled glycine enters the globin, but not the porphyrin.[26] The globin remains chemically quite static. Iron turnover in plasma is astonishingly rapid. Iron utilization is high in iron depletion states and depressed in hemochromatosis, etc.[20] Some hemoglobin can be formed in circulating blood. Nucleated red cells (ducks) take up iron[49] and so do normoblasts and reticulocytes[59] (mammals), but normal adult mammalian red cells do not. Life of red cells in man is about 115 days.[6] In sickle-cell anemia, however, they do not live out their normal life, but are indiscriminately destroyed, some soon, some late.[39]

Penicillin has been successfully labeled with S^{35} and shown to enter the cytoplasm of susceptible staphylococci, not just bound to the cell wall.[17] What this means for ultimate understanding of the action of antibiotics I don't yet know.

Zinc is all through the body in very small amount. There seems to be some mechanism for its conservation and re-utilization. The concentration in human leukocytes is 25 times as high as in the erythrocytes.[58] In leukemia the amount per cell falls off but comes up again in a remission.

Gold is found to concentrate in arthritic joints and also in the wall of an abscess.[8] Silver also concentrates in abscesses.[61] Whether this can be used to diagnose deep-seated abscess we do not yet know.

Na^{24} has been used for some time to test the state of peripheral circulation, by giving a dose intravenously and measuring its appearance and persistence in a limb. More recently it has been given locally (into the muscle) and its rate of disappearance measured.[16] The diagnosis of cardiac disturbances by studying the curve of activity as a dose of Na^{24} moves through the heart has apparently made little further progress in the past year.[45]

Radiomercury has been used to study action of mercurial diuretics. There is an interesting first brief phase of low urine output with high concentration of mercury.[40]

Stable isotopes have been used in fewer researches. They are more difficult to measure. Moreover the radioactive ones are capable of revealing themselves in enormously greater dilution. Heavy hydrogen is of course the most readily and widely useful. Heavy water (D_2O) is the ultimate standard method of estimating total body water. It has been shown by comparison that the antipyrene method is clinically satisfactory.[51] Heavy nitrogen was used to label uric acid, and with this the body pool of uric acid was determined to be fifteen times as large in gout as in health.[7]

The foregoing listing holds some five dozen items that seemed to me novel, important or scientifically stimulating. Obviously there is not time for exploration of the implications of even a fraction of them. If some of you pick up one or two items that fit into the kaleidoscope of your cogitations and make a pattern, I shall feel this long recital has not been boredom unrelieved.

I have one more curious item. By irradiation with twenty million volt x-rays (200 r), living rats have been rendered perceptibly radioactive with a half-life of two minutes.

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The Background of Delinquency

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RECENT study refers juvenile delinquency to the following causes:

1. Overcrowding that forces children to spend time on the streets, flight from home circle, moving pictures, automobiles, radio, television.

Children, more than ever before, are in the company of adults where they are more exposed to adult discussions and conclusions, more often unwise than wise. This is disastrous because children with their limited experience are unable to deal wisely with what they hear and are taught to consider authoritative.

2. The multiplication of laws, to the point where they cease to command general assent and respect.

3. The growth, as a by-product of education, of scepticism and cynicism.

4. The decline of respect for the individual and for his rights.

5. Drift from religion—indifference, even antagonism to the Christian ethic on which our culture is founded.

6. No respect for the law, no fear of the police. "You can't touch me—I'm only a kid."

7. Decline of parental authority. Due to bad example, rather than lack of precept, admonition and reproof.

8. Cynical opportunism—railing against authority—evasion of disliked laws by adults, setting a conditioning of environment for children.

Such a list is limited to superficial surface symptoms; to the boils and carbuncles that indicate deep disorder in the social organism. What then is the virus that vitiates culture?

A recently issued study of juvenile delinquency in California concludes with this admirable declaration: "So we come back to the necessity of satisfying the emotional needs of every child; of providing every child with satisfactory human relationships. Only as we succeed in this, can we hope to build a good society." Those few sentences perfectly express the ambitions of all good parents, of all good pediatricians, and of every psychiatrist who has insight and integrity.

But, to accomplish these fundamental things, we would have had to be able to pick the grandparents and great-grandparents of our children, to have chosen their remote human ancestors, and have been able to influence their prehuman forebears as well. Those prehuman organisms whose conflicts and fears come down through the unending chain of chromosome-carried genes to every newborn infant, constituting much of the "Id" that Freudian dogmas theorize and assign to a place in the organism lying beyond the possibility of awareness, in the unconscious.

The fact that it is alive insures the organism instinctual urges to survive, and to survive in security and comfort if that be possible. But Nature is amazingly lavish and wasteful of life, and it is nothing to be surprised at that, finding some children ill-conditioned to the social order they are to occupy, unyielding Nature wastes their lives. Consider how many ova and sperm male and female organisms generate, and think how few reach their function as adult organisms, as parents. How wasteful, and yet how essential for the survival of those who are to survive. Think of the conflict between sperm and ovum as it begins in human mating. The sperm is an aggressive little bit of protoplasm, aggressive on the ovum; the ovum, in its turn, is resistant; sometimes it destroys the sperm; more often it capitulates. When it does, there is compromise; a compromise that produces the morula. This mulberry-like mass of cells, itself, exhibits the acme of aggression, attacking the lining of the womb as it strives for implantation there in a spot where security and survival will be favored. And the prenatal aggression essential if organisms are to live is only beginning! As the placenta comes into being and digs itself into the uterine walls, contact is made with the maternal blood vessels so that by further aggression the embryo can find protective security and food, not only for that day but for several hundred days to come. With birth, the billions of cells, expressing their biological need, urge the infant to aggression on the breast of the mother in order that they and it may find satisfaction.

From its origin, each cell of the new-born is endowed with aggressive ability to sustain conflict, and a gift for compromise when it encounters resistance. Aggression, conflict and compromise work together to insure survival, not only of the cells, but of the organism which the cells constitute. Nor is the survival of the organism all that is served. For these gifts assure that, when appropriate maturity arrives, there will be power to reproduce the organism and carry on the race.

In its emergent evolution throughout its life, the new organism, itself, will more than sum up the potentialities of the cells, and it will have to use its own aggressive powers to attack the resistant environment in order to acquire the food, air and water, the nitrogen and minerals that it must have if it is to function and to remain alive.

So the new-born child comes into the world as an organism equipped with aggression. It is an aggression ready to be aroused, aroused in response to hunger, a need that comes as a complex of conscious and unconscious desire. (Herein is a perfect demonstration of the unity of body and mind; the ultimate

contradiction of dualism.) The child's need is satisfied, a compromise is made with the mother because satisfaction has ensued for both. Each had a need: The mother to find relief from the pressure of milk in the breast, and the pressure of anxiety for the infant's welfare; the child to find the energy and building material his life and growth demand. At that stage, no one would think of calling the baby bad because it is aggressive and compelled to fight with such means as it has to gain satisfaction for its needs.

But the underlying forces that ultimately take children to the juvenile court, primarily, are just those qualities: Aggression, a sense of individuality, and a willingness to struggle for its own satisfactions.

In older children, the struggle to achieve its own satisfaction may be expressed as revenge, stealing, lying or destructive rowdyism. The latter fault becomes more intense and more disturbing during adolescence; and during adolescence, the sense of individuality, and will-to-power, in those badly-conditioned in early childhood, are often expressed as illicit sex adventures. The psychologists hold that all of these phenomena may be built up as defenses against dissatisfactions and unhappiness visited on children during their infancy. The sum total is anti-social behavior or "badness."

Can parents escape the responsibility for the disasters many of their children have to endure? Well, parents are what they are because they were conditioned to their behaviors and attained their beliefs in their own childhood. They are the products of a culture that had been imposed on them every day since they were born, and on their parents before them. Therein is the vicious circle: The misbehaving child; the family group in which the child was taught, trained and condition to be what it is; the culture which supplied the child's parents, teachers, spiritual pastors and masters with their sense of values and their value judgments.

A child in its family relations can find satisfaction and achieve maturity only if it feels secure, protected, free from uncertainty. And a family circle able to provide these essentials can exist only when the parents themselves feel secure, free from economic, social and personal uncertainty, and have faith in the rightness of their value judgments. In such a home, it makes little difference whether the moral atmosphere is one of austerity or of laxity, provided the children find, in that atmosphere, courtesy, certainty and consistency, leading to a sense of security and belonging; to feel secure, they must know that they are part of a group which is ruled by the ideal of "we" and not by the conflicting demands of many individual "I's."

The father and mother may be stern and exacting, provided they call out their children's respect and make them feel that they, the children, in turn, are respected and made a part of the family's utmost concern; that they belong to a group, not of "give-me's" and "go-getters," but one in which co-operation and mutual consideration are the dominant values. Within the range of their limited experience, children have an acute sense of justice and they estimate its administration much more accurately than many adults can give them credit for, or for that matter, than many adults do.

In these days, when the values men have lived by for twenty centuries are under question, the family circle feels the impact of doubt; the loss of faith; and the result is an uncertainty about right and wrong that not only is hard to live with, but which disrupts the sure pattern of family life. The pattern essential to the achievement for parents and children alike, of those qualities which make individuals mature, effective, useful citizens: Qualities that insure that they, all of them, at all ages, as George Preston points out, should be able to (1) live, (2) live with people, (3) live happily, (4) live productively, (5) live acceptably. In other words, that they will be healthy and stable and able to use the current culture with a minimum of conflict with their fellows and a maximum of satisfaction to themselves.

The organism is a bundle of potential reactions to objects and events in the surrounding world; for children, this is a constantly expanding world, especially in the matter of human beings. It expands from the simplicity of mother-child relationship in infancy, through preschool years to the complexities of school, preadolescent, adolescent and adult environments. Ability to deal with this increasing complexity is the test of maturity. E. B. Holt suggests that genius is a stage of development with high maturity, and that the ethical man has acquired an even higher degree of maturity, in that he is able to put an effective time lag between his responses and the stimulus that comes from the objects and events, many of them very remote, in time or space; and to do this with discrimination and the ability to choose the stimulus that best serves the organism's needs.

Not all parents are going to succeed in achieving this aim. The utility of nature's wastefulness appears in this. Did they all succeed, the world would have no prophets, no revolutionaries, no advance or, if you prefer it, no change, in man's cultural patterns; only dull conformity.

"Goodness" and "badness" have reached types and standards under various conditions of epoch, fashion and circumstance, that vary almost as much as day and night. Too often the standard of goodness for children has been measured by nothing more than how comfortable the little ones are to live with. Preserved Smith, in "The History of Modern Culture," writes, "At all times and in all countries, parents have lavished affection and care on *some* children. But in spite of this, cruelty, spite, ignorance, greed and other evil passions, as well as custom and a perverted sense of parental duty, have made the lives of many children, at most places and in most ages, unhappy."

"Ignorance, custom and a perverted sense of parental duty" function today more often than cruelty, spite, greed and evil passion; and even these latter are more frequently attributable to social and psy-

chic maladjustment of the parents than to inherited original sin. Most often these evils are due to distorted personalities acquired through deforming cultural influences that acted in the parents' childhood; and the parents' parents, in their turn, were subject to the same sort of crippling effects of overstrenuous cultural demands. Consider, for instance, what one great and good man, John Wesley, thought the duty of society to children: The children were "to be waked at 4:00 in the morning, to spend an hour in private devotions." To quote him, "As we have no play-days, neither do we allow any time for play on any day; for he that plays as a child will play as a man." In those days, silence, industry, obedience, respect to elders, truthfulness, respect for the property of others and for one's own pledged word, and conformity to the forms of worship, constituted the pattern of character that God-fearing parents strove to force their children into. The fear of the Lord was the beginning of wisdom but, unfortunately, it was held to be the beginning and end of the philosophy of child-rearing—fear not only of the Lord on high but also of the parents on earth. Fear, the breeder of anxiety.

Of course, our forefathers were striving to do right. To live happily, a child must know that he is only one of many; that the world does not belong to him alone. He must be obedient to circumstance, if not to tyrannical authority. He must learn to respect the property and rights of others, if he is not to be a thief, a liar, or one whose pledges are worthless. The ancients were right in their ambitions for their children's characters, but wrong in the way they went about trying for the result. They believed it possible, by moral and physical force, to fit a child into a preconceived character-pattern. They had unbounded faith in admonition, reproof and punishment, and their well-intended but mistaken efforts caused endless unhappiness, but no more than the lax or careless methods of many modern parents, perhaps not so much.

The child's possibilities for character development for good or for bad, are locked up in it at birth. To bring them out fully and finely, what it most needs physically, are sunshine, fresh air, and free range away from too close contact with too many grown-ups. What it most needs for character development is guidance in a simple environment that is allowed slowly to get more complex as the child grows older.

And also in every human breast there is lodged the tendency to react violently against injustice and tyranny, whether political or parental. On this trend of human nature is based all spiritual progress, all aspiration of the individual soul. Without it man could never have ascended from the slaveries of primitive authoritarianism or of feudal medievalism.

Such an instinct is awake and is active in the breast of every child, but the child's lack of experience, and the parent's lack of comprehension or of consideration, often bring about a degeneration of this noble spirit until it becomes the blind, devastating force that the psychologists have called "negativism"—negativism, the destructive spirit which brings the child into unremitting conflict with his parents, and the adult into battle against the reasonable things of life.

One may well ask how far this widely cultivated negativism provides the germ for the disrupting philosophy of positivistic nihilism that is overtaking the world, filling the minds of men with doubt, uncertainty and distress.

Man's access to the universe is exceedingly limited. It is limited by his five senses, which keep him informed of some of the changes that occur in his immediate environment, and of these changes only. Through this narrow access our forefathers gained a picture of a universe of stars and stardust, of fire and water, earth and air. Within the last century, there has been added a concept of matter, made up of atoms and molecules, both beyond vision and apprehensible only by virtue of imagination. From such a concept of matter grew science and the materialistic philosophy that has come to be ascendant in the 19th and 20th centuries. Today the accepted picture is of a dynamic universe of scattered galaxies of stars at immense distances apart, spread infinitely through what man's mind conceives to be space. Each galaxy is made up of stars, each star itself a sort of lesser galaxy of incessantly moving molecules and atoms, each atom in its turn reproducing the timeless whirl of its constituent particles. A retelling of Heroclitus' dream that "all things flow"—yet who can say with certainty that these figments of the human imagination picture anything of cosmic reality. At the best, what is pictured is an unfeeling universe, terrible and impersonal.

It has been said, "No man can stand naked before the stars." Because of his instinctive fear of the terrible, unfeeling, impersonal universe, in his deepest nature, early man was compelled to search for comfort; for something which would allay his fears. Thus he was impelled to find a satisfying explanation of himself, of his environment and of their interrelation. If he were to survive, he had perforce to find some meaning, some reason for the universe and for himself as part of the universe.

And to help him out in that search for comfort, that flight from fear of the unknown, man called upon a quality which seems to be as intimately a part of him as the material of his blood and bone—the power of phantasy, of day-dreaming. Historically, the earliest known to us of this flow of phantasy was expressed in what the anthropologists call animism, or, better, animatism, in which all the forces of nature which he could discern were endowed each with a life of its own. It is a phantasy that still dominates the thinking and feeling of primitive tribes and, through that human quality, which Professor Freud has personified as the Id, it reaches into our own daily lives, into even that of the most sophisticated modern man, bringing with it residues of fears and perplexities inherited from human and prehuman ancestors.

However, as a major force in man's attempt to adjust himself comfortably to the universe, in time

animatism gave way because of the accumulation of what we are pleased to think of as factual experience. It gave way to anthropomorphism—another form of phantasy which personifies nature and endows her with all the qualities a man believes himself to have. By analogy with his own behavior, earlier man explained the otherwise incomprehensible behavior of the world around him. In the process of this anthropomorphic adjustment, various tribes, races and breeds of men, according to their experience and the ease or difficulty they encountered in finding the means of survival (food, water, shelter), created for themselves many gods in their own images. In the further flow of time, as men came more and more to be integrated into social groupings, and to reach more or less common ideals, monotheism, based upon the experience of the father of the human family—protector, director and dictator—was widely accepted.

For us of the Western world, the priestly servants of such a sovereign God formulated statements of purpose and principles which seemed best to serve the survival of the human race under the circumstances of the time. Thus, humanity was supplied with principles woven into a pattern which seemed to make it easier for the general body of men to fulfill these purposes. For twenty centuries, those principles and purposes have been accepted by what we know as Western civilization. They have been expressed in the various philosophies and religions, designed to serve the survival, security and satisfaction of human beings in this unfathomable space which man has given the name Universe. Out of these developments arose the ideas of evil and good, of taboo and permissibility; and with them came the establishment of authoritative social orders varying with era, locality, climate, sacerdotal ambition and economic need. The leaders of such social orders became the dispensers of the authority necessary to keep civilization functioning in ways they approved.

The family was recognized as a biologic expression of such an order, not only as a biological unit, protective of its individuals, but as a social organism, the nucleus of a larger society. The displacement of the family interest as an ultimate by the individual's interest is one of the crippling defects of modern society. Man, as he struggled for personal security, comfort and survival, acquired concepts of good and evil. All that he fancied served these ends he accepted as good; what he felt hindered them, evil.

The stage of man's history when he pictured nature and nature's forces as endowed with human qualities was the era of priests, kings, religions and philosophies. The primacy of that era was at its height five hundred years ago; it remained dominant until the mid-nineteenth century and today still is extraordinarily influential, perhaps even more so than the materialistic, mechanical teachings that are supposed, with the coming of science, to have overthrown it.

It is odd to think that all the mathematics and physics that give validity to the concepts of Galileo and Newton are based fundamentally on a phantasy, on the concept of an imagined point and a belief in lines of force passing through points postulated to occupy the exact centers of bodies; abstractions that can be useful only in terms of the concepts of number and mathematics. Points and lines are purely imaginary quantities. They cannot be created physically or as such be appreciated by our senses and they are translatable to them only as parts of visible measurable surfaces. No one knows whether numbers were invented or were discovered, whether they are part of a natural order or merely ingenious devices man has created and uses in his attempts to explore his environment.

All this may seem to have no bearing on the problem of child behavior, but it has, for mankind's convictions about good and evil dictate the family judgment of the goodness or badness of its children. On this conviction is based the one essential quality of family life which provides the important conditioning forces out of which will emerge the child's "style of life." One thing above others that a child needs to be protected against is confusion in authority, and another, equally important, is uncertainty in family purpose. And yet, how can it be so protected when the social order itself is so uncertain and so disordered? Nowhere today is there any possibility of certain knowledge or of a consistent development of an agreed canon of desirable behavior. We suffer from some of the residues of animistic conceptual method. Half our actions, social and intellectual, are dictated by residues of anthropomorphic belief; residues that, in the light of current materialism, some of us resist with more or less determination. The result is that we are an uncertain generation of little faith—disillusioned, even while we seek shelter and comfort in new phantasies.

C. E. M. Joad recently put the present issue of our confusion this way. He was dealing with the latest expression of the materialistic, mathematical philosophy, a revival of Comte's positivism, a restatement of that philosophy, buttressed by an appeal to up-to-date physical science. Joad says, "The traditional philosophy of Western Europe holds that transcending the familiar world of things known to us by our senses and explorable by science, there is another of reality that contains values which are qualitative. Of these values, goodness, beauty and truth are preeminent and are the sources, respectively, of ethics, aesthetics and logic. In other words, it is because the universe is, or contains, a moral order that some things are right and some wrong; because it contains an aesthetic order, some things are beautiful and some ugly, and because there is such a thing as truth, that certain judgments are false and others true. Many philosophers would add that the universe contains also a Deity, the source of the values Goodness, Truth and Beauty, these being, as religion puts it, the modes of the Deity's revelation to man. Metaphysics, for these philosophers, is the study of the reality that

transcends and underlies the familiar world of sense impressions and is, therefore, in part the study of values and of God.

"These ideas are the general outcome of Western philosophical thinking, reinforced by Christianity over the past nineteen centuries. It is a dual purpose of Western philosophy to reveal truth and to increase virtue by providing man with principles to live by and purposes to live for—principles derived from an examination of values. The principles are those of morality and the purposes are the attainment of an increase in what is good, beautiful and true, in one's individual life and in the total human community."

With the increasing influence of a materialistic philosophy of science on opinion, doubt, which is essential to the purpose of science, began to gather quite illogically about the conception of transcendental values: so that, with the advent of the 19th Century, positivism gathered vitality and emerged as "Logical Positivism." As a result this large and very influential school among leaders of scholarly opinion tells us that there are no such things as value judgments, for, say these men, "there are no values, and the true function of philosophy is no more than to clarify the propositions of science by exhibiting their logical relationships and by defining the symbols that occur in those propositions."

These logical positivists tell us that propositions which have meaning fall into one of two classes; those that concern empirical matters of fact and those which philosophers have called "a priori," and which concern the "relations of ideas." The former have meaning only if they can be verified—verification meaning that some possible sense experience should be relevant to determine their truth or falsehood. The latter group, those which concern the relations of ideas, are the propositions of mathematics and of logic. They are certain, say the positivists, only because they are purely analytical.

These thinkers maintain that all metaphysical assertions, that is to say, all assertions about a realm of values transcending the world accessible to sense are meaningless because only those empirical propositions have meaning which can theoretically be verified: and since any sense experience must inevitably be an experience of the familiar world and not, therefore, of an order of reality transcending the familiar world, no metaphysical proposition can be verified and it cannot be asserted that there is a non-empirical world of values.

Therefore, according to the teaching of the positivists (and they teach widely) all value judgments are valueless; hence, ethics, aesthetics and religion are without worth. They say that the statement, "This is wrong," cannot be wholly reduced to empirical concepts since there is no sense experience of the quality of wrongness. Therefore, as it is not empirically verifiable, it follows that the statement, "This is wrong." is meaningless. Likewise, the statements, "This is beautiful," "This is good," "This is bad," because these express value judgments and cannot be analyzed, they would dismiss as meaningless. Any such statement, they say, can do no more than express the moral, aesthetic or religious feelings of the person who uses them. It cannot be argued about. Extending this line of discussion, the positivist philosophy dismisses as without meaning the ideas, not only of Deity, but even of belief and disbelief, for, in their view, God is a metaphysical term belonging to an assumed reality that transcends the world of sense experience. The idea of God, therefore, comes under the general ban on all metaphysical statements; to say that He exists is neither true nor false; it is neither atheistic nor agnostic; it is simply meaningless. It is the contention of this philosophy that both scepticism and doubt become equally irrational; belief and disbelief cease to be in the list of subjects suitable for intellectual consideration, and philosophy is left without any wisdom to offer the world or any guidance for the perplexed human race.

It may seem that it is overweighting the teaching of a small group of philosophers to attribute to it widespread social influence, but such ideas diffuse downwards; rapidly, inevitably reaching innumerable individuals to whom philosophy is an alien word. However, amongst these are myriads of the uncertain, confused, fearful, dissatisfied and resentful. These avidly absorb this materialistic nihilistic teaching with all the greater ease when assured, as so often they are, that this gospel of denial is based on "Science," a word, a verbal symbol, that for those ignorant of the activities and practices of physical science, has taken on implications of magic.

What has this to do with good and bad children? Everything! Increasing delinquency may well be the forerunner of social collapse. The confusion and uncertainty about what is bad and what is good that these philosophical conflicts promote, invade countless families and are reflected in unsound intrafamily relationships, robbing children of the certainties and serenities essential if they are to become well adjusted to the family situation. Dwelling in such unhappy, uncertain, confusing family conditions, the little ones are robbed of the education, conditioning, training and the practice in behavior necessary if they are to live their own future lives happily and efficiently. And, in addition, the situation tends to exalt and exaggerate the feeling of egoistic individuality at the expense of group unity. Such a philosophy felt but not realized is a source, probably, of the adult unrest which so often drives grown-ups of the family to retreat into alcoholism, thus importing further irrationality, uncertainty and discomfort into the family life. It is often overlooked that the parents' habitual moderate alcoholic indulgence is as apt to create these uncertainties and these family life disorders as a parent's occasional indulgence in excessive drinking.

All these intrafamily disturbances conspire to rob the children of the education, behavior and conditioning for entering into personal relationships necessary if they are to live their own future lives

happily and efficiently, able to meet any social situation of which they may find themselves a part. The healthy growth of the individual depends on a healthy family life. And that, in itself, depends on a satisfying understanding and utilization of moral values.

Thus, so-called "bad" children are fruits as well as the victims of defective value judgments on the part of families—defective judgments derived from a culture that exalts materialistic hedonism, and rejects transcendental values; a culture that discourages the enjoyment of life for its own sake; that leads men to forget the lesson that gave the Greeks contentment; the lesson that Euripides expressed in the lines, "He who knows as the long day goes that to live is happy, has won his heaven"; a culture that robs man of comfort in those dreams of his that give him confidence in the idea of transcendental values; values which his consciousness has no difficulty in utilizing as the bases of truth, beauty and justice; ideas which alone have enabled humanity to rise above the beast level; ideas without which the most materialistic scientific investigator would have no criterion of honesty, a virtue which, after all, is what gives science its ultimate worth, and the scientist his power and his satisfactions.

And, so far as children's social delinquency is concerned, the so-called "bad" children are the fruits of defective judgments on the part of families responsible for bringing up the young. Value judgments distorted by materialistic cultures which supply families with the only basic materials they can have for their moral standards in a world that has rejected the transcendental.

We have to ask ourselves, then, whose is the responsibility for the delinquency of the child?—the child's, its parents' or the social order's which, through its encouragement and taboos, establishes bases for such values as the parents must acquire.

I wish that every parent might read, and learn by heart, the exquisite lines of Charles Peguy:

"Childhood, a budding, a promise, a pledge. . . ."

". . . . that little earnest of a bud which shows itself at the beginning of April.

"It is the bud that looks as if it were the tree's parasite, as if it ate at the tree's table . . .

"And yet it is from that bud, on the contrary, that everything comes.

"Without a bud that once appeared, the tree would not exist. Without those thousands of buds that come out once at the beginning of April and sometimes in the last days of March, nothing would last, the tree would not last and would not keep its place as a tree. . . .

". . . All life comes from tenderness. All life comes from that tender, delicate April bud. . . .

"Now I tell you, says God, that without that late April budding, without those thousands of buds, without that one little budding of hope, which obviously anyone can break off, without that tender, cotton-like bud, which the first man who comes along can snap off with his nail, the whole of my creation would be nothing but dead wood.

"And the dead wood will be cast into the fire."

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Leading Causes of Childhood Death

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SUMMARY

The over-all rates of death in childhood decreased five to ten fold during the first half of the century, with the greatest drop occurring in deaths due to infections. The death rate due to accidents has shown a relatively slight decrease; hence, accidents are now the leading cause of childhood death, and in California account for 32 per cent of the deaths in the group 1 to 15 years of age.

In California, and among certain insured groups of children, cancer is the leading or second leading cause of death due to disease. There is indication that the incidence of leukemia is increasing in early childhood and in the older age groups.

Accidents, the leading cause of childhood death, do not happen; they are caused, and so can be prevented. The medical profession should concern itself much more actively in the field of accident prevention.

A PROFESSION whose main concern is with the postponement of death and cure or prevention of disability may well scrutinize the major causes of these disasters. Dickinson and Welker[4] have proposed two new measures of death, namely the number of life years, and the number of working years lost. The former is based on the life expectancy of the individual at the time of his death, and the working years are calculated on the premise that the normal individual would work from age 20 to age 65. When these new measures are applied to the causes of death for all ages, accidents become the leading cause of working years lost and the second leading cause of life years lost. Thus the death of children and young adults is doubly disastrous, because of the economic loss to society of their working years and the large number of life years lost to the individual and his family. The causes of early death are obviously of greater importance than are the causes of death of older persons. Everyone must die of something some time, but still remote is the medical millennium when death will only be due to senility, and will only occur at some very elderly optimum age.

It is of considerable interest to examine the changing leading causes of childhood death over the first half of this century. Tables 1, 2 and 3,[3, 5, 7] show the five leading causes of death by age groups for selected years. The death rates from all causes in each group have declined sharply. The greatest decrease has occurred in death caused by the infections. For the communicable diseases of childhood, diarrhea and enteritis, tuberculosis, and influenza

TABLE 1.—*Death Rates for the Five Leading Causes of Deaths by Age Groups for Selected Years—United States*
(Rate for 100,000 Estimated Population)

	Under 1 year
1916	
All causes	10,100.0
Diarrhea	2,410.0
Premature births	1,930.0
Pneumonia (including influenza)	1,430.0
Congenital malformation	680.0
Injury at birth	420.0
1947	
All causes	3,373.1
Premature births	1,162.0
Congenital malformation	483.3
Pneumonia	373.6
Injury at birth	370.1
Asphyxia	162.9

TABLE 2.—*Death Rates for the Five Leading Causes of Deaths by Age Groups for Selected Years—United States*
(Rate for 100,000 Estimated Population)

	Age 1-4 Years		
Causes	1900	1920	1947
All causes	1,983.8	987.2	159.1
Pneumonia	386.6	283.7	24.8
Diarrhea	303.0	141.3	.....
Diphtheria	271.0	90.5	.....
Tuberculosis	101.6	.....	6.6
Measles	87.6	.....	.....
Accidents, non-motor	.....	73.5	30.1
Whooping cough	.....	57.0	.....
Congenital malformations	.....	.....	12.5
Motor vehicle accidents	.....	.....	12.0

TABLE 3.—*Death Rates for the Five Leading Causes of Deaths by Age Groups for Selected Years—United States*
(Rate for 100,000 Estimated Population)

	Age 5-14 Years		
Causes	1900	1920	1947
All causes	385.9	263.9	69.1
Diphtheria	69.7	28.0	.....
All accidents	38.3	.....	.....
Pneumonia	38.2	45.1	4.4
Tuberculosis	36.2	22.4	.....
Diseases of heart	23.3	17.4	3.9
Accidents, non-motor	.....	31.9	16.7
Motor vehicle accidents	.....	.....	10.0
Cancer	.....	.....	3.2

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the decrease has approximated 50 to 90 per cent since 1930.

In this same interval the decrease in the accidental death rate has been only 19 per cent. Such diseases as diarrhea, diphtheria, and measles, which were among the five leading causes of death during most of the first quarter of the century, are now far down the list in an insignificant place. With the decline of disease as a cause of death, accidents have assumed a place of leading importance. In the United States accidents account for 26 per cent of the deaths in the 1 to 4 year age group, and for 38 per cent in the 5 to 14 year age group. In California the percentage of children lost by accidents is slightly higher; 28 per cent in the 1 to 4 year age group and 40 per cent in the 5 to 14 year age group. Of the deaths in the 15 to 24 year age group, 46 per cent are accidental.

At present the important causes of death due to disease in the United States in the 1 to 14 year group are pneumonia, congenital malformations, tuberculosis, diseases of the heart, and cancer. These all rank far below death by accident in numerical importance.

The leading causes of childhood deaths in California are at variance with corresponding data as regards children in the United States as a whole. In Tables 4, 5, and 6 [10, 5] are presented the leading causes of death by age groups, expressed in per cent of total deaths for each age group. (The vital statistics for California are available only in this form.) The data are nearly identical for children under one year of age, except that pneumonia rates third in the United States, and fifth in California. However, in the 1 to 4 age group in California cancer is the second leading cause of death due to disease, and the leading cause of death due to disease in the 5 to 14 year group. This same high rank of cancer exists in the same age groups among the children insured in the Industrial Department of the Metropolitan Life Insurance Company.[8, 9] It is probable that this high rank of cancer as a cause of childhood death in California and in the insured group of children indicates that superior medical care and living conditions have resulted in a lowering of the death rate from infections. There is, however, some evidence that the incidence of cancer, especially leukemia, is increasing. In any case it is being diagnosed more frequently.

TABLE 4.—*The Five Leading Causes of Childhood Deaths by Ages in 1947*

(Expressed in Per Cent of Total Deaths in Each Age Group)

	Under 1 year
In California:	
Premature births	35.4%
Congenital malformations	14.3%
Injury at birth	13.2%
Prenatal and natal	9.6%
Pneumonia	9.6%
In the United States:	
Premature births	30.4%
Congenital malformations	14.3%
Pneumonia	11.0%
Injury at birth	11.2%
Asphyxia	4.8%

TABLE 5.—*The Five Leading Causes of Childhood Deaths by Ages in 1947*

(Expressed in Per Cent of Total Deaths in Each Age Group)

	Age 1-4 years
In California:	
Accidents (excluding motor vehicle)	17.1%
Pneumonia	11.9%
Motor vehicle accidents	10.9%
Cancer	8.6%
Congenital malformations	8.5%
In the United States:	
Accidents (excluding motor vehicle)	18.8%
Pneumonia	15.2%
Congenital malformations	7.8%
Motor vehicle accidents	7.5%
Tuberculosis	4.2%

TABLE 6.—*The Five Leading Causes of Childhood Deaths by Ages in 1947*

(Expressed in Per Cent of Total Deaths in Each Age Group)

	Ages 5-14 years
In California:	
Accidents (excluding motor vehicles)	22.0%
Motor vehicle accidents	18.0%
Cancer	12.1%
Pneumonia	4.8%
Tuberculosis	4.4%
In the United States:	
Accidents (excluding motor vehicles)	24.1%
Motor vehicle accidents	14.4%
Pneumonia	6.3%
Diseases of heart	5.6%
Cancer	4.6%

Examination of the death rates due to leukemia (including the aleukemias) for the United States by age groups from 1930 to 1948, and for England and Wales for 1931 to 1945, reveals that there was a steady rise in the death rate due to leukemia for all age groups. The rate of increase was relatively high in the very young (deaths from this cause doubled) and even greater in the very old where the increase was fivefold. The rise was slight in the middle age groups (see Charts 1 [6] and 2 [1]). Had the increase been due solely to improved diagnosis, it would have been uniform for all ages. It is beyond the scope of this paper to speculate on the possible causes of the increasing incidence of leukemia.

The annual child accident toll for the United States is shown in Table 7.[2] The death rate from diphtheria (for all ages) has been reduced from 40.3 per 100,000 population in 1900 to 0.6 per 100,000 population in 1947. In this same interval the death rate from all accidents has fallen only from 72.3 in 1900 to 69.4 in 1947. It is now easy to prevent diphtheria or to cure it, and obviously it is a medical responsibility to do this. Ought it not be as obvious that prevention of the death of a child by drowning or poisoning, or falling out of an automobile, is also a medical responsibility?

Physicians and the laity both have an attitude toward accidental death and disability quite differ-

ent from the attitude toward diseases causing mortality and morbidity. This is perhaps because medicine—inoculations, laboratory research, test tubes, microscopes, and animal experimentation — plays little part in accident prevention. There is no doubt that a child killed or disabled by an accident is just as dead or disabled as thought poliomyelitis, cancer or rheumatic fever had been the etiologic factor. A great deal of publicity is given the diseases mentioned; drives are made to raise funds to carry on research and give care to the victims. And it is desirable that this be so. Yet parents tend to worry excessively about their children's developing certain diseases, especially poliomyelitis or rheumatic fever, while they are concerned hardly at all over the possibility of death or disability by accident, even though the latter is many times more liable to happen than the former. The annual accidental death of 14,000 children far exceeds the deaths from many of the leading disease killers combined. Considering the importance of accidents as a killer and disabler of children, relatively little activity is directed by any group toward prevention of them; and the medical profession gives prevention hardly any attention at all.

Most accidents are preventable, but prevention is a complex and many-faceted problem and will require the efforts of many groups besides the medical profession. Yet just as it is the duty of physicians to routinely inoculate children against whooping cough, diphtheria and tetanus, and where indicated, against other diseases, and to prescribe vitamins to prevent the deficiency diseases, so also it is their duty to instruct parents how to prevent accidents, and to help spread the knowledge that most accidents are preventable.

Young mothers must be instructed never to leave a baby on a surface from which it may roll—witness the number of babies who fall to the floor the first time they turn over. They must be cautioned always to close safety pins; they must be told how to make a bed with a firm flat surface in which the baby

TABLE 7.—*United States Child Accident Toll*

Under 15 years	
Yearly Death Total	14,000
Motor vehicle accidents	3,500
Burns, scalds and explosions	2,700
Drownings	2,300
Mechanical suffocation	1,400
Falls	900
Firearms	600
Poisons	600
Railroad accidents	300
Injuries, over	1,500,000

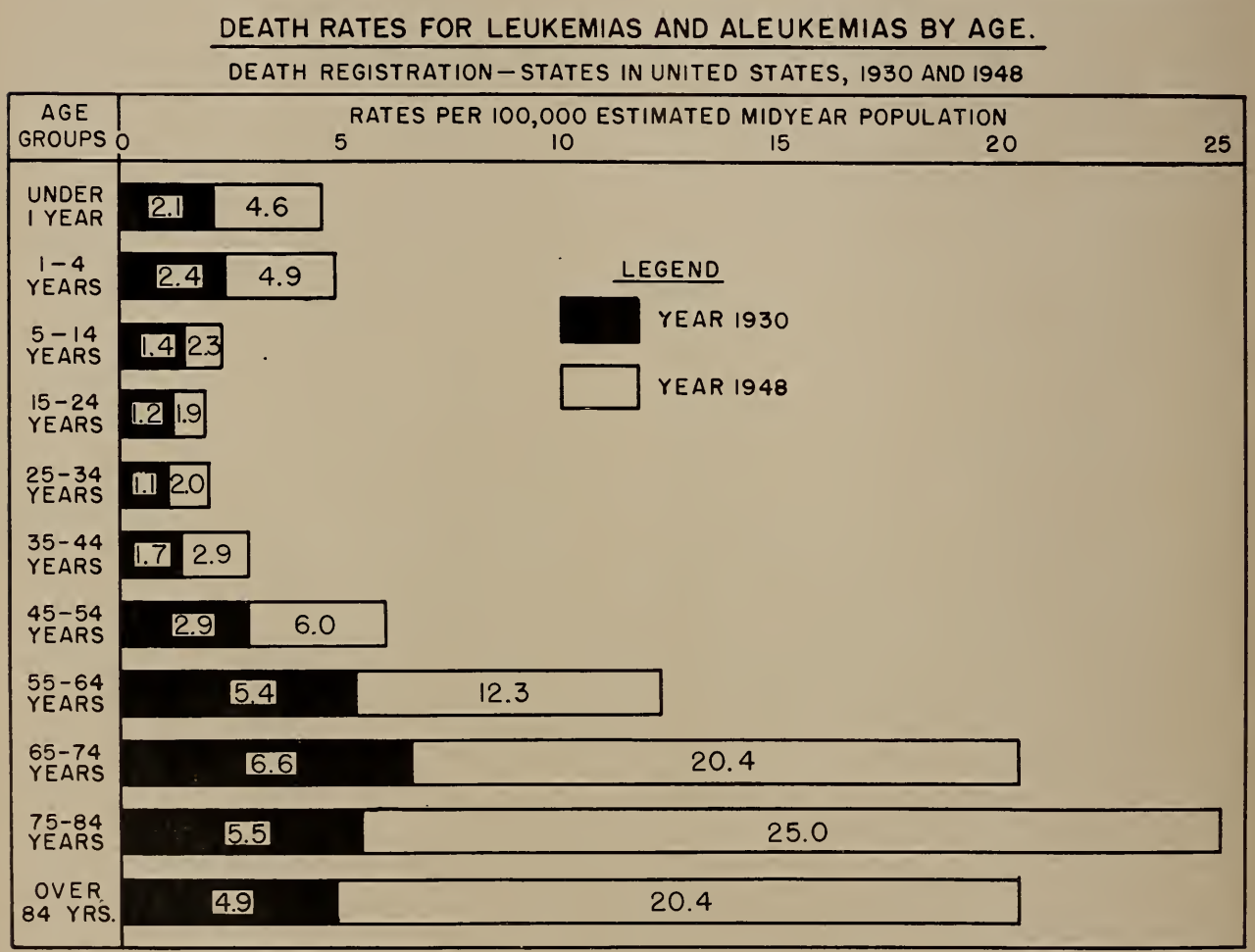

Chart 1

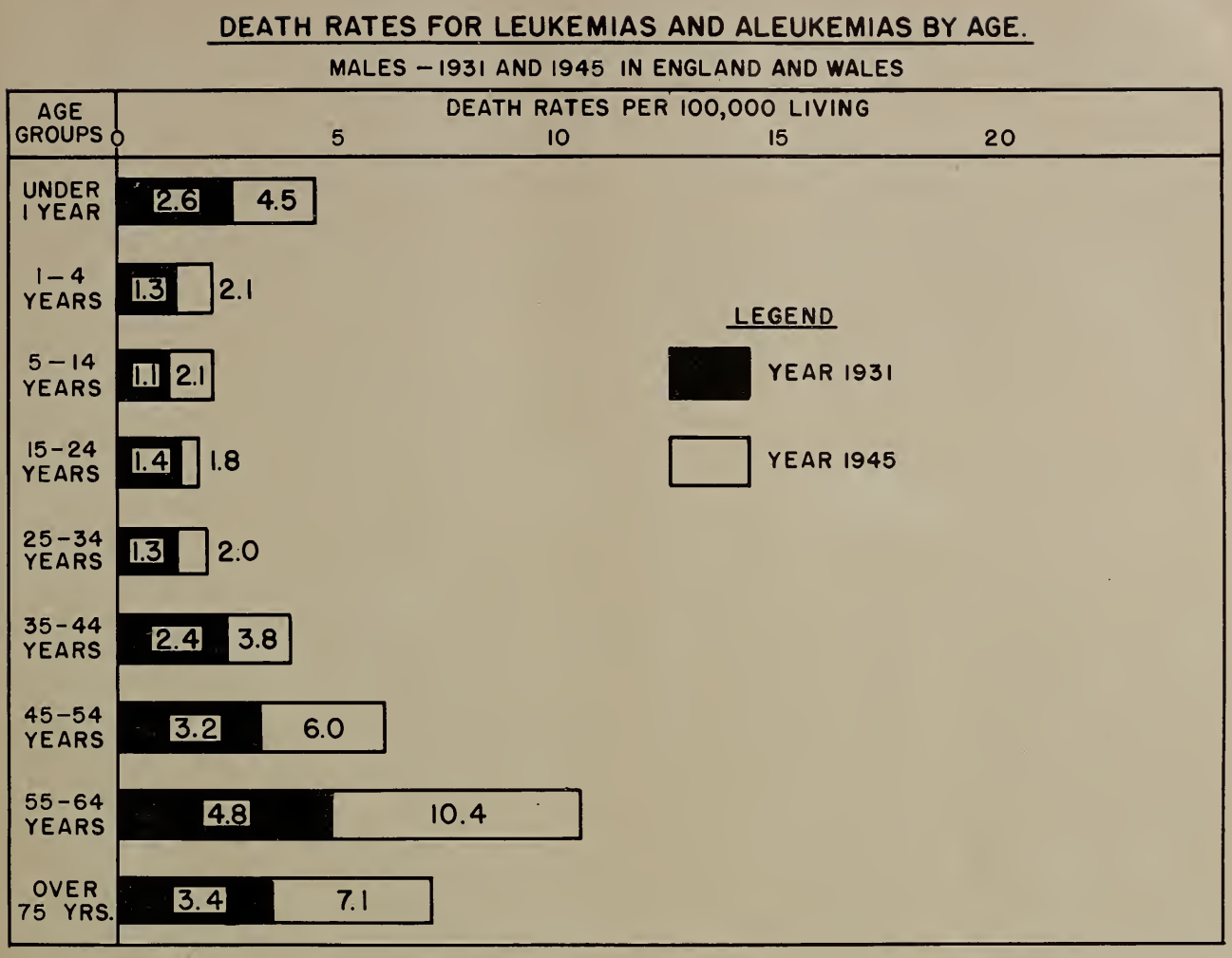

Chart 2

cannot suffocate. As the child gets older new dangers must be warned against, and his environment rendered safe. Heaters must be guarded to avoid burns and setting fire to clothing; care must be taken to prevent toddlers' pulling of vessels of scalding fluid onto themselves; and accessibility to matches must be prevented. Six hundred children a year, most of them under five years of age, die from poisoning; from eating sleeping tablets, aspirin, caustics, antiseptics, cleaning fluids, arsenic, insecticides. Such deaths can be prevented by invariably keeping all these dangerous substances inaccessible to children.

Falls account for the death of nearly a thousand children yearly. Hence parents must be cautioned to so supervise and control their children that falls from windows, roofs, trees and other heights may be minimized. Improved supervision and exercise of proper caution is also necessary to prevent drowning. Each year some 2,300 children, most of them over five years of age, drown. Most of the drownings follow falls into water from docks, river banks, or into garden pools, watering troughs, wells, or swimming pools.

Prevention of deaths in accidents involving motor vehicles, which annually take the lives of 3,500 children, is mainly a problem of traffic safety. However, many injuries and some deaths could be prevented by use of seat belts to prevent small children being thrown against the dashboard or out of the car in the event of collision or sudden stopping. The all-too-frequent fall of a child from a moving car can be prevented by the constant use of a special safety device which prevents the opening of car doors from the inside until the device is released. Small children must be kept out of streets and must not be allowed to play in driveways where so many have been run over by a backing car.

Some children, as some adults, are accident-prone. It is possible that some parents foster accident-proneness in their children. When the same child has been involved in repeated accidents or stomach washings, psychiatric counseling may be in order.

By constantly instructing mothers in child accident prevention methods, and by stimulating community propaganda on accident prevention, physicians should play the leading role in the reduction of the accidental death rate, just as they have played the leading role in the reduction of the death rate due to disease.

The medical profession might properly form a Research Foundation for the Study and Prevention

of Accidents. Since accidents do not *happen* but are *caused*, this leading cause of childhood death can be prevented.

Discussion by HARRY F. DIETRICH, M.D., *Beverly Hills*

Dr. Clark has documented one of the most important problems in pediatrics, and whether we like it or not, we must assume responsibility for its solution. From the standpoint of importance, the first four problems of pediatrics are the prevention of prematurity, the prevention of congenital anomalies, the prevention of accidental death and crippling and the prevention of emotional maladjustments. If we wish we can probably pass the responsibility for the first two problems to the obstetricians, but we must actively contribute to solution of the problems of accidents and emotional aberrations.

I can agree with everything that Dr. Clark has said, except her intimation that smothering is an important cause of death. Although a large drunken mother might conceivably smother a small infant sleeping in the same bed with her, I have never known of a well baby smothering. Infants, however, have been actually stranged by contraptions used to prevent theoretical smothering. I believe that the 1,400 deaths from smothering indicated on Dr. Clark's chart represent the same coroners' mistakes that keep the thymic myth alive—insufficient or inadequate autopsies. Bowden in Australia recently studied 40 cases of alleged smothering, and in every instance found some other valid cause for death. He suggested that what we in the United States need is not the proposed "Foundation for the Prevention of Smothering" but a "Society for the Performance of More and Better Autopsies."

The individual pediatrician can help in the solution of the accident problem at three levels:

1. In the physician-patient relationship he can advise parents on accident prevention.

2. At the community level he can mobilize existing groups and direct them to this laudable goal. In Los Angeles, Miss Rhea Ackerman of the Children's Hospital has been singularly effective in energizing awareness to the accident problem. She has recruited hospital auxiliary groups, stimulated parent-teacher organizations, delicately needled the National Safety Council, cajoled the newspapers and radio, interested the Boy and Girl Scouts and in general acted as the catalyst for effective community action.

3. The need for national action is two-fold. The value of country-wide dissemination of accident prevention information is obvious. Less apparent is the glowing need for statistical information on serious injury and permanent crippling from accidents. The pediatrician, indeed, has much to do.

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Chronic Ulcerative Colitis—Psychosomatic Factors

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SUMMARY

In six cases of idiopathic ulcerative colitis here reported, close correlation with emotional stress was shown. Psychosomatic relationship seemed definite. Experience with 85 patients with ulcerative colitis has led to the suggestion that emotional stress may be causative or a predisposing factor in some, perhaps all, such cases.

ALTHOUGH the clinical manifestations are fairly well defined, the concepts of the origin and delineation of chronic ulcerative colitis are not clear-cut. One established characteristic of the disease is a pronounced tendency to recur. Another is the preponderant incidence among persons in the age span from adolescence to about the fortieth year. The disease has been reported occasionally in children, and the author has observed one patient with a first attack at age 61.

It is possible to differentiate as a class certain cases in which the disease is due to, or associated with, chronic infection with dysentery bacilli. Even in this group the disease cannot with certainty be ascribed to the bacillary infection alone. The same is true of cases in which there is current or antecedent amebiasis. Here the importance of secondary bacterial infection has been definitely recognized. Into another classification might be put a large residuum of cases in which primary biologic damage has been done to the colon, as by nutritional deficiency, congenital abnormality, or preceding severe infection with dysentery bacilli or amebae.

Recently in reviewing 65 cases previously reported[3,4] as well as the histories in about 20 subsequent cases, the author was impressed with the pronounced tendency to relapse. This led to meditation on other factors which might be common to all or to a definite group of these cases and related to the incidence of relapse. Consideration of certain patients under treatment at the time brought recognition that present in each were factors of heavy emotional stress and nervous tension. Recent references in the literature emphasize this aspect of the subject.[1] Kirsner and co-workers,[2] in a survey of 100 cases, stated that in 34 per cent of them, relapses could be attributed to emotional disturbances. These investigators noted another outstanding clinical feature: The cure rate (6 per cent) was exceeded by the death rate (14 per cent).

It seems that so-called idiopathic chronic ulcerative colitis may arise on a psychosomatic basis, and while it is doubtful that this is basic in the origin of all cases, it is a possible underlying factor in all. It seems to give adequate explanation of the peculiarities observed clinically and to offer a sound basis for effective treatment. The mechanism would involve the usual spasm of involuntary muscle fibres, local and general malnutrition, and resulting interference with local circulation.

The following six summarized case histories illustrate the association with emotional factors.

Case 1: A man, 30 years of age, was first observed April 9, 1947, with complaint of mucus and blood in the stools.

Hyposensitivity to Libman's test was noted, with low knee jerks. The abdomen was tense and thin but not tender. Sigmoidoscopic examination showed an area in the upper rectum and lower sigmoid colon of pink, ground-glass appearing mucosa, oozing blood and a considerable amount of dark gray mucus. No parasites were found and cultures of swabs grew only the usual colonic flora. Examinations of the stool showed large amounts of gross blood, gray mucus and pus cells. X-ray examination of the gastrointestinal tract showed no organic lesion although there was evidence of moderate mucosal thickening in the lower jejunum and ileum.

A clinical diagnosis of early chronic ulcerative colitis was made, and although the patient was an agreeable, pleasant person who said he was unworried and felt no nervousness, underlying neurotic factors were suspected.

Psychotherapeutic conferences elicited a story of childhood and early adolescent hostility toward the father, who was characterized as dominating, imperious and dogmatic, especially in relation to insistence that the son prepare for engineering as a profession. There was also a history of previous attacks of colitis and gastrointestinal distress associated with emotional disturbances:

1. While attending a private high school for boys the patient had had an attack of epigastric pain with severe constipation and fever. The symptoms quickly subsided.

2. A few months later dark red blood appeared in the stool with regular bowel movement. There was a slight elevation of temperature, but no pain.

3. Indigestion and abdominal discomfort followed transfer from the private high school (and abundant personal attention) to college where supervision was minimal.

4. An attack of colitis with pain, bleeding, dysentery and loss of weight occurred during the patient's second college year when a childhood sweetheart had broken their engagement to marry. The colitis persisted for two years despite dietary and medicinal therapies. Recovery was gradual but complete. The patient failed in his studies, changed schools, but still "could not stomach" the profession his father had chosen for him.

After the interview in which this story was finally crystallized, the colitis was sharply accentuated.

Soon afterward the patient was inducted into the army, where he adjusted fairly well until ordered to prepare for overseas duty. Colitis occurred again. It necessitated hospitalization, lasted ten weeks, and resulted in discharge from the army.

Subsequently, the patient became happily married. He was employed as a clerk with no professional training. However, he stated that he still had the feeling of pressure from his father.

The colitis gradually subsided and symptoms of colonic bleeding and inflammation disappeared. Although the possibility of recrudescence was explained, the patient decided against psychotherapy.

Case 2: A 36-year old married male was first observed by the author April 19, 1948, with a complaint of severe lateral and posterior pain under the lower left ribs on inspiration. Beginning January 1, 1948, the patient had had severe diarrhea with colic preceding each of ten daily bowel movements. Nausea and vomiting were present on the first day only, and there was no gross bleeding. There was no history of earlier gastroenteric symptoms of any kind. The diarrhea gradually subsided in the next few days but did not stop entirely. In mid-February it again became worse and the patient began losing weight, had a low fever and felt weak. He consulted a physician and was hospitalized. After careful study, the tentative diagnosis was chronic idiopathic ulcerative colitis.

The patient remained in the hospital two months with fever ranging from 100°F. to 103.5°F. daily. Weakness increased, loss of weight continued, and bowel movements averaged eight to ten each 24 hours. In a proctoscopic examination an easily bleeding area on the edge of the lower rectal valve, with apparently normal mucosa above it, was noted. Cultures of stools were negative for pathogens and adequate search revealed no parasites.

When first observed by the author because of the pain in the lower left chest, the patient was hospitalized because of evidence of pneumonitis. X-ray examination confirmed this, and a further x-ray study 18 days later showed improvement. Those of the colon showed an atonic dilated organ with evidence of extensive mucosal edema and ulceration. At that time there were eight to ten bowel movements daily, with pain but no blood.

Repetition of tests and examinations that had been carried out at the time of the previous hospitalization confirmed the findings that had been noted then. Treatment consisting of blood transfusions, various antibiotics and other medication, dietary control and high vitamin intake had no effect on symptoms.

As it had been noticed that the patient was tense and highly emotional, he was discharged from the hospital and referred to a psychiatrist, who reported a high degree of dependence upon both mother and wife, with resentment toward the mother and probably toward the wife. The patient had maintained independence only with difficulty for the past several years. Struggle between dependence and independence had been enhanced by a recently developed ambivalence with regard to an executive of the firm for which he worked. The psychiatrist felt that the tension produced by these conflicts played an important role in the colitis.

In the course of several months of psychotherapy the diarrhea diminished and finally stopped. The patient gained weight and said he felt much better. He had quit his former job and after several months of idleness he took another. With adequate guidance, future good adjustment was considered probable.

Case 3: A housewife about 25 years of age who had two children was first observed March 31, 1939, because of dysentery which had begun a month before with eight to ten bowel movements daily, attended by pain and low fever. Stools contained blood and mucus. There was history of previous attacks, one five years and another four years previously, which had been of short duration. A year later a third attack lasted two months and the patient was hospitalized. Amebae were said to have been found in the stools at that time. After lapse of another year and a half, a fourth attack occurred during pregnancy and the pregnancy was terminated. Symptoms disappeared after two months, apparently without relation to medical treatment.

The patient was hospitalized for the current illness. Upon sigmoidoscopic examination it was noted that the mucosa had a red ground-glass appearance. It bled easily, and a thin fibrinous exudate was present. No parasites were found on adequate examination and results of specific tests for bacterial or other pathogens were negative. Gastrointestinal x-rays with barium enema showed colonic spasticity only. The attack subsided in about two months but in the next several years relapses of varying degrees of severity occurred, with increasing x-ray evidence of ulcerative colitis.

Finally, in 1947 the patient was referred for psychiatric appraisal and was found to have emotional immaturity "quite typical of patients with ulcerative colitis and other colitic diseases."

Case 4: A housewife, 37 years of age, was first observed March 16, 1945, with complaint of diarrhea, headache, extreme fatigue, frequent sore throat, indigestion, and pains in legs and feet. There was history of "chronic colitis"—severe recurring attacks of diarrhea with blood and mucus in the stool.

The patient, who was 47 inches tall, weighed 105 pounds. She was intense, anxious and poorly nourished.

Gastrointestinal x-ray studies showed only pylorospasm and persistent gastric residue. No parasites were found in the stools. There was no fever.

Interview elicited evidence of high nervous tension and emotional stresses dating from childhood, and chronic hostility toward mother and husband. In the ensuing three years there were numerous flare-ups of colitis associated with episodes of aggravated emotional tension.

In February, 1948, the patient was hospitalized because of severe colitis and prostration. X-ray studies with barium enema showed haustrations almost completely absent, and there were numerous punched-out ulcers from the upper sigmoid colon to the cecum. Proctoscopic examination showed the rectal mucosa to be normal. The temperature was 103°F. and the patient was mentally depressed and in a state of severe malnutrition. Ileostomy was done and for 15 days there was clinical improvement, moderate psychologic leavening and better food intake. Proteins, vitamins and electrolytes were given parenterally. Mental depression returned, was followed by physical relapse, and the patient died April 9, 1948.

At postmortem examination there was anatomic diagnosis of healing chronic ulcerative colitis, acute ulcerative ileitis and severe emaciation. The lesions of colitis were almost healed but considerable scarring was noted. An interesting feature was the relatively recent ulceration of the ileum. Scattered ulcers were found extending as far upward as the jejunum. Inanition apparently was the cause of death.

Case 5: The patient, an unmarried woman 26 years of age, was first observed March 9, 1945, because of recurring dysentery, with blood and mucus in stools, and severe colic. Repeated episodes of several weeks each had occurred in the preceding year.

The patient was 66 inches tall, weighed 120 pounds and appeared to be poorly nourished, nervous, and apprehensive. Upon physical examination, tachycardia and vasomotor instability were noted. A red ground-glass appearance of the mucosa of the rectum, with many shallow irregular ulcers. was observed in sigmoidoscopic examination. No parasites were found in a study of mucosal scraping, and no pathogens developed on cultures. Skin food-antigen tests gave 1 plus positive reactions to onion, tea, potato and yeast. That

for total milk was negative. Gastrointestinal x-ray studies showed no abnormality. The basal metabolic rate was 5 plus.

Psychologically the patient was extremely insecure with great dependence on and unconscious hatred of her mother, who was exacting, meticulous, and highly possessive. The patient was fearful, and this culminated, as her marriage approached, in panicky fear of marriage and increased feelings of guilt toward her mother. Psychotherapy largely dissipated the guilt, fear, hatred and dependence so that she entered marriage normally and has had to date only one short and mild attack of colitis. The improvement has been remarkable as the patient's independence, insight and security have increased.

Case 6: A 28-year-old married woman with no children was first observed September 28, 1943, because of dysentery (12 bowel movements daily) with much blood, mucus and pain. The patient had had life-long constipation with attacks of diarrhea. After scarlet fever at age 7 she had attacks of dysentery lasting for weeks or months. The patient had always disliked milk, and it caused indigestion if drunk in more than minimal amount. Eating spiced, fatty and fried foods also caused gastric distress. Many stool examinations over the years had never confirmed suspicion of amebic dysentery. The patient had not lost weight and at no time was fever present.

General abdominal soreness was noted. The blood pressure was 100 mm. of mercury systolic and 72 mm. diastolic. Erythrocytes numbered 3.5 million with hemoglobin value (Sahli) of 54 per cent. Leukocytes numbered 4,800 with 57 per cent granulocytes and 39 per cent lymphocytes. Gastrointestinal x-ray studies gave evidence only of chronic colitis, especially of the descending colon. Roentgenologic studies of the gastrointestinal tract in 1946 had shown no abnormality, and studies with barium enema showed no evidence of colitis.

In psychiatric appraisal, rage against the father, with repeated death wishes, was noted. The patient had a panicky fear of her father which was associated with his addiction to alcohol. This animosity, which extended back to early childhood, was extended later to the patient's husband. Attacks of dysentery, associated with colonic hemorrhage, severe colic and nausea, recurred irregularly until January, 1948, when psychotherapy was instituted. No exacerbations have occurred since.

DISCUSSION

It is to be noted that in the first 35 cases of chronic ulcerative colitis reported by the author, 17 of the patients were definitely neurotic. In the second report, covering 30 cases, it was noted that "allergic and psychologic" features were prominent. All the patients in the six cases reported herewith had pronounced emotional disturbances. Kirsner, and co-workers[2] stated: "The tendency toward exacerbations and remissions of symptoms is one of the characteristic features of nonspecific ulcerative colitis. It is possible to attribute the relapses in this series to emotional disturbances in 34 per cent (of 100 cases); to infections of the respiratory tract in 29 per cent, and to physical fatigue in 14 per cent. However, these represent several of the more common difficulties in life, and, hence the relationship may be more accidental than causal. Indeed, relapses seem to occur with any form of stress and to be a reflection of a labile intestinal response."

It would appear that psychodynamic appraisal of the patient were an essential part of diagnostic study in each case. This is more important than search for parasitic, bacterial or allergic factors. Demonstration of Endameba histolytica, dysentery bacilli, or neoplasm at once removes the case from the category of idiopathic ulcerative colitis.

TREATMENT

Psychotherapy should be instituted early. It must be skillful and often it may have to extend deep into the emotional substrate.

It is always to be remembered that when organic evidence of colitis is present, the colitis must be treated as a thing in itself, while psychotherapy reaches far deeper and aims at prevention of recurrence.

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Diagnosis and Differential Diagnosis of Poliomyelitis

The Management of Patients in the Hospital Admitting Room

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SUMMARY

Because of the great variety of early symptoms of poliomyelitis and their similarity to the symptoms of a number of other diseases, in times of epidemic many patients are admitted to hospital on suspicion of poliomyelitis. At such times the prime purpose of the hospital admitting room staff is to distinguish between patients with poliomyelitis (or other diseases requiring immediate treatment) and those who may be referred into other channels.

This presentation (1) points out the superficial similarities of the clinically observable signs and symptoms and of laboratory data in poliomyelitis and in other diseases, and (2) discusses the more occult dissimilarities which aid in differentiation.

DURING an epidemic, for every case in which poliomyelitis is diagnosed and the patient is admitted to hospital for that reason, there are four or five in which patients who do not have the disease are examined because of symptoms which simulate those of poliomyelitis. At such a time, the prime purpose of the admitting room is to admit patients with poliomyelitis and such others as warrant additional study, and to refer all other patients into channels providing for further diagnosis and treatment. The admitting room should be provided with the necessary personnel and equipment to make the distinction and to handle any emergency. Respirator, suction apparatus and oxygen are vitally necessary.

When the patient enters the admitting room of the Los Angeles County Hospital, his parents or other relatives are given a brochure which explains in detail what is going to be done with the patient, what laboratory procedures are to be performed, what the administrative policy of the hospital is, what care should be given contacts at home, what the quarantine regulations are, and other useful information of the kind. This brochure, written in non-technical language, is most effective in controlling the anxiety of the parents or other relatives and in saving the time of the attending physicians and nurses.

A complete and thorough history is important and is written in the admitting room. It includes the following:

1. Chronological listing of all symptoms from onset, with emphasis on fever, headache, sore throat, diarrhea or constipation, muscle spasm, pain and weakness.
2. History of contact with persons with poliomyelitis in the family or neighborhood.
3. History of unusual physical exertion, fatigue, chilling, or exposure.
4. History of recent operation in the upper respiratory tract.
5. History of illness during the previous month.
6. History of past muscular, neurological, pulmonary or cardiac disease.

A complete and thorough physical examination is essential in diagnosing poliomyelitis. Particular emphasis is placed on the following points:

1. Stiffness of the neck, back or hamstring muscles. The Brudzinski, Kernig and spinal signs are important if positive. Hoyne's head drop sign is indicative: When the shoulders are lifted off the bed the head falls back due to weakness of the anterior neck muscles. This head drop sign is found in other diseases causing meningismus but is frequently found in severe poliomyelitis.
2. Reflex changes. Attempt is made to elicit Babinski, Chaddock and Oppenheim reflexes, and the reflexes of ankles, knees, biceps, triceps, cremasters, abdominal, spinal and gluteal muscles are examined. Absence of reflex or difference in response between the two sides is confirmatory evidence. The presence of pathological reflexes referable to the upper motor neuron, such as the Babinski, is contraindicative of poliomyelitis as a rule.
3. Muscle weakness. By various maneuvers muscles can be tested for strength. Weakness present may range from mild to complete. Not only must the extremities be tested, but the strength of the intercostal muscles and diaphragm must be estimated, and the function of the muscles of the neck, palate, pharynx, larynx, face and eyes must be appraised. Especial diagnostic import is placed on the presence of head drop indicating weakness of the sternocleidomastoid muscles.

From the Communicable Diseases Unit of the Los Angeles County General Hospital and the University of Southern California School of Medicine.

4. Sensory changes. Mild hyperesthesia may occur in poliomyelitis, but anesthesia, paresthesia, or sensory changes at definite vertebral levels preclude the diagnosis in nearly all cases.

5. Changes in the throat. In many cases there is mild to moderately severe injection of the pharynx.

Laboratory procedures routinely carried out while the patient is in the admitting room are complete blood cell counts, urinalyses, and spinal fluid examinations. The spinal fluid is examined for initial pressure, number of cells present per milliliter, types of cells seen in stained smears, the protein content (Pandy test), and quantitative sugar. In addition, specimens are saved for culture, for determination of chlorides, and for Wassermann test. At the discretion of the physician, additional procedures may be done. A partial list includes blood cultures, blood chemistry determinations and x-ray studies.

Until such time as a quick, accurate, specific laboratory test becomes available, the diagnosis of poliomyelitis must depend upon the clinical evaluation of the history, symptoms, physical signs, and laboratory aids currently available. Since the clinical picture may vary greatly, intimate knowledge of what poliomyelitis does and does not do is a necessity in judging each case.

Clinically poliomyelitis may be divided into three main categories: (1) the abortive; (2) the non-paralytic; and (3) the paralytic.

Poliomyelitis of the abortive type is mild in character and of short duration. The symptoms are referable to the upper respiratory tract (such as sore throat) or to the gastrointestinal tract (such as constipation or diarrhea) but there is little evidence of central nervous system involvement, such as meningism, muscle spasm or muscle weakness. The majority of poliomyelitis cases falls into this category, but for practical purposes it is impossible to diagnose the abortive type except by inference on an epidemiological basis.

Non-paralytic poliomyelitis differs from abortive poliomyelitis in that physical signs and laboratory findings are indicative of central nervous system involvement, namely: (1) Meningeal signs (stiff neck and back, positive Kernig, Brudzinski, and spine signs; (2) varying degrees of muscle spasm; (3) changes in superficial and deep reflexes; and (4) the presence of abnormal spinal fluid findings. The muscles most frequently tight are the hamstrings, back and neck muscles, posterior calf muscles, pectoral and other muscles of respiration, quadriceps femoris and biceps brachialis. Reflexes are found to be absent, diminished, or unequal. Non-paralytic poliomyelitis, which is most difficult to diagnose because of the similarity of symptoms to those of other disease entities, accounts for about 65 per cent of the recognizable cases observed during an epidemic.

Paralytic poliomyelitis differs from the non-paralytic in that muscle weakness is also present. Weakness is of the flaccid or lower motor neuron type and may range from mild paresis to complete paralysis either in isolated muscle groups or complete paralysis of large segments of the body. This involvement of isolated muscle groups with varying degrees of weakness is an important distinguishing feature of paralytic poliomyelitis.

Anatomically, paralysis in poliomyelitis may be classified as spinal, bulbar, encephalitic, or as combinations of these, such as bulbospinal. Highest in incidence is the spinal type, recognized by involvement of the extremities or trunk. The lower extremities are much more frequently involved than the upper. With extensive involvement of the lower extremities, paralysis of the urinary bladder and rectum is not infrequent. With extensive involvement of the upper extremities the intercostal muscles and diaphragm are often involved. Associated with weakness are a diminution or abolition of deep reflexes and early disappearance of superficial reflexes. The Babinski, Chaddock, and Oppenheim reflexes are always negative in this type.

Bulbar poliomyelitis is recognized by involvement of the cranial nerves, cardiac, and respiratory centers. It may occur alone or in conjunction with involvement of the spinal cord and encephalon. Any cranial nerve may be involved but the nerves most frequently affected are the sixth, seventh, ninth, tenth, eleventh, and twelfth. Tenth, eleventh, and twelfth nerve involvement is usually bilateral. Ten to 20 per cent of the cases of poliomyelitis are of the bulbar type.

Encephalitic poliomyelitis is much less common. Stupor or delirium, hyperpyrexia, and profound toxemia are present in this type. Convulsions may occur and there may be paralysis of an upper motor character with spasticity instead of flaccidity, hyperactive reflexes and a positive Babinski sign. Involvement of the medulla and the presence of bulbar signs are usually associated with encephalitic poliomyelitis.

Knowledge of the onset, of expected febrile course, and of signs and symptoms other than those already mentioned is of value in determining the final diagnosis of poliomyelitis. Study of the febrile course is especially important. In approximately 20 per cent of the cases, and principally in children, there is a biphasic fever curve. There is a short initial febrile period of several days' duration, with nonspecific symptoms, which is followed by a fever-free period of a varying number of days (usually two to four), and then a second period of fever accompanied by signs and symptoms of central nervous system involvement.

Chills and chilly sensations are observed at the onset of bulbar involvement in 10 to 15 per cent of the cases, and in 2 to 4 per cent at the onset of spinal involvement. The duration of the febrile phase of uncomplicated poliomyelitis varies from one to 14 days. (In the biphasic type, duration commonly is counted from the onset of the second period of fever.) The configuration of the fever chart approximates a sine curve with a gradual rise to a plateau and a gradual fall. A "septic type" of fever curve indicates complications.

The majority (approximately 80 per cent) of non-paralytic cases run a febrile course of one week or less, and only a small number of patients (4 per cent) are febrile 10 to 14 days. Patients with paralytic poliomyelitis tend to have fever for longer periods; approximately 50 per cent continue to have elevated temperatures into the second week or beyond. In non-paralytic and in spinal types of poliomyelitis, maximum temperatures in 90 per cent of cases range from 100° to 103° F.; temperatures of 105° F. are rare. In bulbar and encephalitic poliomyelitis temperatures to and exceeding 105° F. are not too uncommon, temperatures of 104° F. and above being recorded in about one-third of the cases.

There is no correlation between the height of fever and the degree and amount of muscle tightness or weakness. However, there is a close correlation between duration of fever and the percentage of paralytic cases and the severity of paralysis and muscle spasm.[5]

Patients with febrile courses up to one week show weakness in about 25 per cent of cases; 50 to 60 per cent of those with fever continuing into the second week show weakness. The longer the duration of fever, the more likely is the occurrence of paralysis.

Severe weakness (3 plus to 4 plus on a scale of 1 to 4) is observed in about 15 to 20 per cent of patients running febrile courses up to one week, whereas it occurs in about 50 per cent of those with fever continuing into the second week. Patients with paralytic poliomyelitis who have fever for nine to 14 days almost inevitably have severe degrees of weakness in the muscles involved. The longer the fever persists, the more severe is paralysis liable to be.

Similarly, severe muscle spasm (3 plus to 4 plus) occurs in about 30 per cent of cases in which the patient has fever for periods up to one week; in cases in which fever persists into a second week, severe spasm occurs in approximately 45 per cent. Extension of paralysis ceases when fever subsides; infrequently extension of weakness may occur after the patient becomes afebrile.

Muscle spasm persists for a variable time after fever leaves. This aids in distinguishing between meningeal irritation and tightness of the posterior neck, back, and thigh muscles. The former subsides as the patient becomes afebrile, whereas muscle spasm may persist for weeks after the fever abates, and even may become more severe unless treated.

Sensory changes occur in poliomyelitis, but they are limited. Moderate hyperesthesia at the onset is occasionally observed. Paresthesia is exceedingly rare. Anesthesia and sensory levels do not occur. Pain in the muscles increased by motion is frequent.

The most ominous sign—and the cause of most of the deaths—in poliomyelitis is impaired respiration. This may be due to a variety of factors: (1) Palatal and pharyngeal paralysis allowing accumulation of mucus and saliva in the throat, thereby obstructing the airway; (2) paralysis or severe spasm of the intercostal muscles and diaphragm; (3) atelectasis; (4) disturbance of the respiratory center; (5) laryngeal paralysis or spasm.

Most patients will complain, at the onset, of headache, frontal, occipital or parietal in location. This is of especial significance in diagnosis of poliomyelitis in children, for they rarely complain of headache as a presenting symptom in most other diseases. Two other signs worthy of note are the disproportionately rapid pulse rate for the degree of fever, and the clear sensorium excepting in severe bulbar or encephalitic cases.

Of great diagnostic aid is examination of the spinal fluid. This is especially helpful in diagnosing the obscure mild case. Occasionally several examinations of the spinal fluid are necessary, after a suitable interval, to note any changes. Abnormal changes in the spinal fluid are present in 80 to 90 per cent of recognizable cases of poliomyelitis—in some epidemics more, in others less.[9] There is usually an increased number of cells, the number ranging from 10 to 200 cells. At times as many as 1,000 to 2,000 cells are found, but this is uncommon. The cells are predominantly lymphocytes except in the early days of the disease, when neutrophils often predominate. Associated with the increased cell count is a moderately increased content of protein in the spinal fluid.[3] Great increases in protein are unusual. The spinal fluid chlorides and sugar levels are normal (sugar content should always be determined). No organisms are found. The pressure is usually moderately elevated, rarely it is very high, and often normal or low. It is well to note that in both paralytic and non-paralytic poliomyelitis, the results of spinal fluid examination may at times be within normal limits.

Count of leukocytes in the blood and determination of sedimentation rate are of diagnostic aid. The leukocyte count ranges from 2,500 to 25,000, but counts below 4,000 and above 20,000 are unusual. Leukocyte counts have been noted to vary somewhat from place to place and even in the same locale from year to year. For example in 1943 in Los Angeles, counts of 16,000 or above were observed in only 5 per cent of the cases. In 1948 such counts were noted in 19 per cent of the cases. The average count in 1943 in Los Angeles ranged from normal to somewhat low. In 1948 the average count was moderately elevated. There was no correlation between the leukocyte count and the degree of paralysis or the severity of the illness.

In most cases of poliomyelitis, the sedimentation rate is accelerated. The increase is mild (from 1 to 13 mm. above normal at the end of one hour) and in most cases the rate reverts to normal within two to three weeks after the febrile period.[4] When corrected for fever, this increase is less. There is no appreciable difference between the sedimentation rate for patients with paralytic poliomyelitis and the rate for patients with the non-paralytic form of the disease.[7]

Because the symptoms, physical findings and laboratory findings associated with poliomyelitis are so variable, the differential diagnosis is necessarily

complex. During the 1948 epidemic in Los Angeles, patients with 75 different clinical entities were sent to the hospital because of suspicion of poliomyelitis. Diseases that produced the following findings were suspect: (1) Weakness or painful movement of the extremities; (2) spasm of neck, back or hamstring muscles; (3) asymmetry of superficial or deep reflexes; (4) difficulty in breathing; (5) difficulty in swallowing; (6) stupor or convulsions; (7) weakness of the extraocular or facial muscles; (8) abnormal findings in the spinal fluid.

Often the true diagnosis may be made quickly in the admitting room by careful history-taking and physical examination.[8] It may be found that the apparent weakness is actually the result of trauma—for example, a fracture or dislocation. Or difficulty in swallowing may be traced to the presence of a peritonsillar abscess or of a foreign body. Difficulty arises at times from inability to make adequate appraisal of the physical condition, particularly in the case of an infant or small child, because of resistance to examination. A period of observation then is necessary.

There are, however, some cases in which the neurological findings are such that further observation of the course of the disease and further laboratory tests are necessary before it is possible to establish the correct diagnosis. The following are some of the conditions which may give rise to symptoms which may at first be similar to those of poliomyelitis: tuberculous, purulent or viral (mumps, etc.) meningitis; encephalitis other than that due to poliomyelitis; influenzal syndrome; rheumatic fever; infectious neuronitis (Guillian Barré), and meningismus (especially when due to lobar pneumonia or bacillary dysentery).

Tuberculous meningitis is often more difficult to differentiate from poliomyelitis than any other single entity not only because it presents a picture of central nervous system involvement, but also because associated with it are spinal fluid changes that superficially resemble those of poliomyelitis. The course in the untreated case is one of progressive deterioration of the patient, ending in death. In this disease the spinal fluid shows (1) a consistently low sugar level, (2) chlorides of 500 mgm. per 100 cc. or less, and (3) acid-fast organisms on smear or culture. Other confirmatory evidence can be obtained usually by x-ray of the chest and tuberculin skin test.

Because delay in treatment is fraught with danger, purulent meningitis is the most important disease to be differentiated from poliomyelitis in the admitting room. In a typical case of acute meningitis the patient is seriously ill, the onset of meningeal signs is abrupt, the sensorium is confused, the superficial reflexes react symmetrically, and convulsions are not uncommon. The spinal fluid is cloudy to milky in appearance; and if the disease is caused by bacterial infection, the causative organism often can be quickly demonstrated by direct smear or culture unless the patient has received doses of antibiotics or chemotherapy. In the event of an epidemic, however, in which spinal fluid cell counts in many true cases of poliomyelitis range from 500 to 1,500 (mainly neutrophils in the early stage of the disease), differentiation becomes far from simple. A factor that may be of help in this regard is the decreased sugar content in the spinal fluid in meningitis. Mention should be made of two cases of poliomyelitis observed by the authors in which there were petechial hemorrhages, although this sign is generally considered as indicative of meningococcemia. Special note should be made of the occasional cases of influenzal meningitis in which, early in the course of the disease, there are a few hundred cells in the spinal fluid, predominantly lymphocytes, and only slight neck rigidity. The differential diagnosis is further confused by the occasional case of poliomyelitis in which there is severe opisthotonos and the spinal fluid contains 1,500 cells. Between these two last noted extremes occur the most perplexing problems that confront the diagnostician.

Although there are many viral diseases capable of producing spinal fluid pleocytosis and a clinical picture indistinguishable from non-paralytic poliomyelitis, the one most common is mumps. The diagnosis is simple in the presence of parotid swelling, but occasionally the swelling precedes the onset of meningitis by a week or two. Sometimes it does not occur until after symptoms of meningeal infection appear. In some cases there may be no parotid swelling at any time. In cases of mumps meningoencephalitis without salivary gland involvement, diagnosis must depend solely upon a rising complement fixation titre or upon results of an agglutination inhibition test. Prolonged observation often is necessary to establish the diagnosis.

In the case of viral encephalitis such as Economo's disease, or equine or St. Louis encephalitis, laboratory virus studies, usually with paired sera, are necessary to confirm the diagnosis. Howe[6] has pointed out that when encephalitic signs are accompanied by flaccid paralysis of the extremities the diagnosis of poliomyelitis is relatively secure.

Muscle spasm may be simulated by the myalgia of influenza but careful examination should reveal that the muscle pain is accompanied by guarding rather than actual spasm. In influenza the muscle spasm does not persist after the fever has subsided as it often does in poliomyelitis. Also the headache present in influenza will usually respond to analgesics while the severe headache often occurring in poliomyelitis responds only to lowering of the spinal fluid pressure by lumbar puncture.

Rheumatic fever in which there is involvement of the spinal column and extremities without obvious swelling and redness rarely may be confusing. Again the apparent weakness and tightness are due to voluntary guarding against painful motion of the involved joints. Local diseases or injury, especially osteomyelitis, aseptic necrosis, epiphysitis, fractures and dislocations may on occasion produce muscle spasm of the back and hamstring areas, and a lum-

bar puncture and x-ray study may be necessary to rule out poliomyelitis.

Weakness of the extremities and trunk occurs in infectious neuronitis, and this syndrome must be considered as a diagnostic possibility in many cases of paralytic poliomyelitis. The absence of fever, symmetrical distribution of the weakness, and the typical albuminocytological disproportion in the spinal fluid *early in the disease* aid in diagnosis.[1] It should be pointed out again that absence of cells in the spinal fluid and protein content of 80 to 120 mg. per 100 cc. is not too uncommon in poliomyelitis. Weakness of the cranial nerves requires consideration of possible brain tumor or abscess, diphtheritic polyneuritis, or, in children, a post-convulsive state following a febrile convulsion due to an acute illness.[2] In the latter the neurological findings are usually quite transient.

Meningismus (signs of meningeal irritation without pleocytosis) is most commonly a concomitant of tonsillopharyngitis and otitis media in children with high fever. Pneumonia, especially affecting the right upper lobe, often may cause symptoms somewhat similar to those of poliomyelitis, but the higher fever and the clear spinal fluid are of aid in differentiation. In small children, if findings on clinical examination of the chest are equivocal, roentgen study may be necessary. Bacillary dysentery in its early stages before the onset of diarrhea, when patients have fever, delirium, stiff neck and stiff back, may be confused with poliomyelitis.

Some mention should be made of cases of hysteria and anxiety neuroses. These are frequently very difficult to diagnose early, especially during an epidemic when the signs and symptoms of poliomyelitis are published in many newspapers and magazines.

Grateful acknowledgment is due Dr. Albert G. Bower for his suggestions and encouragement.

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Endemism of Coccidioidomycosis in the Paraguayan Chaco

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SUMMARY

Skin testing of 541 men with coccidioidin was carried out in an investigation of endemism of coccidiodomycosis in the Paraguayan Chaco. In two areas where the climate is hot, dry and windy, positive reactions developed in a considerable number of the employees of an oil company who were of various racial origins, as well as among native Indians. In a third area, where rain is more plentiful and vegetation lush, only 2 per cent of 250 Indians tested had positive reaction to coccidioidin.

THE geographical distribution of coccidioidomycosis is related principally to hot, dry, windy and dusty areas where little rain is encountered.[1, 6, 7, 9] Identification of clinical cases in a given area arouses suspicion of endemicity; and if positive reaction to skin tests with coccidioidin, the validity of which has been generally recognized in the United States for such investigation,[1, 2, 8, 9] develops in a substantial number of residents tested, then the suspicion is confirmed.

Two clinical cases have been identified within the personnel of the Union Oil Paraguay,[4] a company which has worked in the Paraguayan Chaco for some four years. These two cases were encountered in persons living in the central zone of the Paraguayan Chaco (Zone B, Figure 1), where the climate is typical of endemic areas. The discovery of the two cases led to a survey with a view to establishing an index of probable coccidioidal infection within the personnel of the company.*

With a view to covering the three characteristic zones of the Chaco (Figure 1), the survey included a group of Guazurangue Indians, typical inhabitants of the north and northwestern zone of the Chaco (Zone C, Figure 1), also a group of Lengua Indians, who inhabit the southeastern part of the Chaco (Zone A, Figure 1).

TOPOGRAPHIC AND CLIMATIC CHARACTERISTICS OF THE PARAGUAYAN CHACO

The "Chaco Boreal" or "Gran Chaco Paraguayo," generally speaking, is a vast, flat area except for a few small hills in the northern part, the most prominent of which, Cerro Leon, is some 35 kilometers long, 20 kilometers wide and 600 meters high. The climate is hot and arid, with temperatures reaching 45° C. (112° F.) or more. The wind, predominantly from the north, blows constantly and with considerable force the major part of the year. Rains begin in October, predominate in December and January, and gradually diminish in the following months, becoming rare after the month of May.

From the point of view of topographical and physical characteristics, the Chaco may be divided into three well defined zones; the southeastern (A), the central (B), and the northwestern (C) (see Figure 1).

Zone A. This zone is of generally lower terrain, susceptible to flooding in the rainy seasons and in the periods of overflow of the Pilcomayo and Paraguay rivers. The flora consist principally of extensive palm groves and tall grass, with a scattering of quebracho and other varieties of large trees. A large part of this zone is owned and inhabited by cattle ranchers, and the fertile soil is irrigated by numerous small streams and lagoons formed by the local rains which are, generally speaking, more prevalent in this area (55 to 65 inches per year). Numerous tribes of Indians inhabit this zone, among them the Lenguas who are found throughout the section from Puerto Casado to the Monte Lindo River.

Zone B. The soil of this zone, although sandy in places, is essentially a clay. In general the zone is heavily wooded and has an erratic growth of spiny underbrush and cactus, but there is no grass to prevent the easily pulverized clay powder from being blown by the strong north winds. This is particularly true of all sections where dirt roads exist or the brush has been cleared—in other words, all the areas which are populated.

This zone is very arid and windy. Annual rainfall is from 19 to 27 inches, and arroyos, rivers, and other watercourses are completely lacking. The rain that collects in small depressions or aguadas located throughout the area is the only drinking water.

Among the fauna of the area are numerous varieties of burrowing rodents as well as many sylvan animals such as deer, wildcats, pumas, pigs, and tapirs. Vinchucas (*Triatomas infestans*) are abundant, as are mosquitoes, flies and ticks.

The two principal centers of population are Mariscal Estigarribia, military headquarters of the Paraguayan Chaco, and the Mennonite colonies, 100 kilometers to the south.

Zone C. This zone is a desert, with the windblown sands accumulating to form dunes. The an-

*A staff doctor for the company, the author was in an excellent position to carry on such an investigation. Fortunately he had been corresponding with Dr. Charles E. Smith of the Stanford University School of Medicine and the Commission on Acute Respiratory Diseases of the Army Epidemiological Board, and Dr. Smith made the survey possible by sending the necessary coccidioidin and by faithfully answering even the smallest question.

nual precipitation is far below that of Zone B, and water holes are practically non-existent. Vegetation consists of a few scrubby bushes and scattered cacti. Temperatures are consistently high and a strong north wind blows almost constantly, carrying with it a powdery sand that penetrates every opening or crack.

The Guazurangue Indians are the only typical and ancestral inhabitants of this part of the Chaco. In addition there is the personnel of a small military garrison located at Irendague or General E. Garay.

It was in zones B and C that the principal exploration program of the company was carried on; and for a period of more than three years these zones were the habitat of the personnel subjected to skin tests with coccidioidin.

THE COCCIDIOIDIN SKIN TEST

The coccidioidin used in the tests was prepared at the Stanford University School of Medicine for the Army Epidemiological Board. As is known, the coccidioidin has a very high degree of specificity, and it has been definitely demonstrated that there is no cross-reaction of coccidioidin in the tuberculous. However, there is recent evidence of cross-reaction with histoplasmin.[10]

The material was diluted 1:100, and 0.1 to 0.3 cc. of this dilution was injected intradermally. Results were read 24 and 48 hours after injection. Induration over 0.5 cm. in diameter at either time was considered a positive reaction. The size of reaction indicated by symbols is the generally adopted one:

± Induration with diameter under 5 mm. or redness without induration.
\+ Induration with diameter of 5 to 9 mm.
\++ Induration with diameter of 10 to 19 mm.
\+++ Induration with diameter of 20 mm. or over.
\++++ Necrosis.

A positive reaction, according to Smith,[8] may be interpreted as is a positive tuberculin reaction; that is, it signifies past or present infection and does not prove active infection. Sensitivity to coccidioidin, once acquired, may endure for years even in persons dwelling long outside the area in which they became infected.

INITIAL RESULTS OF SKIN TESTS

The initial skin tests were made in the month of March 1949, upon a group of 291 adult men, of whom 209 were employees of the company and 82 were Guazurangue Indians. The entire group may be considered almost exclusively as related to zones B and C of the Chaco. The results are shown in Tables 1 and 2. The duration of residence in the area by company employees who had positive reaction ranged from ten months to 17 years.

TABLE 1.—*Detail of Results of Initial Tests (Zones B and C)*

Nationality	Number of Men	Positive* Reactions No.	Positive* Reactions %	Negative Reactions No.	Negative Reactions %
Paraguayan	186	29	15.5	157	84.5
American	10	5	50	5	50
Guazurangue Indians	82	36	43.9	46	56.1
Other nationalities	13	1	8	12	92
Total	291	71	24.3	220	75.7

*Reaction was not considered positive unless the indurated area was at least 6×5 mm.

TABLE 2.—*Degree of Reaction*

Degree of Reaction	Number
++++	1
+++	6
++	26
+	38
Total	71

COMMENT

In both of the previously mentioned clinical cases of coccidioidomycosis, x-ray films of the chest were typical and erythema nodosum was present. Both patients had strong reaction to coccidioidin. In a review of filed data on patients which was conducted after the skin testing, it was found that three men who had strong positive reactions (two of them with +++ and one with ++++) had been ill within the period 1947-1949, showing symptoms of acute infections of the respiratory system. Two had had dry pleurisy which had persisted for from one to two weeks. The diagnosis at the time of illness was influenza and pneumonia, but in light of their later strong reactions to the skin test, they now may be presumed to have had primary coccidioidomycosis.

The majority of the North Americans tested had been in the Chaco for more than two years and some of them had previously worked in areas considered endemic in the United States, which might account for the high percentage of positive reactors within that particular group.

In the group of Paraguayans tested were some who had lived in the same area for many years before being employed by the company.

The Guazurangue Indians tested had lived in the north and northwestern part (Zone C) of the Chaco all of their lives.

There were no positive reactions in men who had spent less than ten months in the Chaco, although 45 of the 291 men tested had been in the Chaco for ten months or less. Hence it would appear that all those with positive reaction (with the possible exception of the North Americans who had been previously exposed) had acquired the sensitivity after a residence of some duration in the Chaco.

RESULTS IN ZONE A

After the tests in Zones B and C of the Chaco had been completed, further investigation was carried on by the same method in Zone A. As previously

pointed out, this area is completely different from Zones B and C. In Zone A the skin tests were administered to 250 Lengua and Sanapana Indians who have been domesticated and are employed by the local ranchers. All had lived in the area five years or more. Results of the tests are shown in Tables 3 and 4.

TABLE 3.—*Detail of Results of Secondary Tests (Zone A) 250 Indians Subjected to Test*

Tribe	Number Tested	Positive Reactions No.	Positive Reactions %	Negative Reactions No.	Negative Reactions %
Lengua	240	5	2	235	2
Sanapana	10	0	0	10	100
Total	250	5	2	245	98

TABLE 4.—*Degree of Reaction*

Degree of Reaction	Number
++++	0
+++	0
++	2
+	3
Total	5

COMMENT

The tests were conducted in the same manner as those in Zones B and C and the results were interpreted on the same basis. The coccidioidin used was from the same lot. It was diluted immediately prior to making the tests. The results contrast sharply

Figure 1

with those noted in the tests in Zones B and C, not only with regard to company employees but also to the Guazurangue Indians of the northwestern area. It is therefore evident that there is a well defined area (Zones B and C) where the index of coccidioidal infection is remarkably high, and it is interesting to note that the characteristics of the soil, climate and vegetation in Zones B and C are similar to those encountered in previously known endemic areas. Concomitantly, it is not surprising that Gines,[3] who recently conducted a similar survey in Asuncion, noted virtually no positive reactions in that sector.

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Cytology of the Postnasal Drip

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SUMMARY

About half of a series of 100 consecutive patients with disturbances of the eyes, ears, nose or throat complained of postnasal drip. When smears of the mucous discharge were examined it was found that in about a third of the cases in which there was complaint of drip, neither eosinophils nor neutrophils could be demonstrated. This indicates that causes of the drip other than allergic disease and infection must be considered.

Cytologic examination of the postnasal drip showed that about one-third of the patients with nasal disease or histories positive for allergic reaction had nasal eosinophilia. Nasal eosinophilia was noted occasionally in patients with normal-appearing nasal structures and in patients with no history of allergic disease.

WITH the advent of the antibiotics has come a shift in attention to the cause of chronic nasal conditions and how they may be relieved. Of fundamental diagnostic importance in this regard is the cytologic examination of the postnasal discharge. This aspect of examination has been emphasized by Hansel.[4,5] Rawlins[8] expressed the opinion that cytologic examination is absolutely essential and is diagnostic. "The finding of eosinophils in the nasal mucus," Rawlins said, "is characteristic of nasal allergy, just as the neutrophil is characteristic of infection."

OBJECTIVES

Bearing these ideas in mind, the cytologic examination of the postnasal drip of 100 adult patients with disturbances of the eyes, ears, nose or throat was undertaken as a preliminary study to throw any possible light on two questions:

1. What information on the cause of the drip might be revealed; are those complaining of the drip more liable to have eosinophils or neutrophils in the mucus than those not complaining; and, is the presence of the drip or of the cells in the drip related to evident nasal disease?

2. For clinical purposes, what classifications of patients with nasal or postnasal discharge should have a cytological examination made of the discharged material? If not all such patients, then what kind of selected patients?

Presented at the 33rd Annual Meeting of the Pacific Coast Oto-Ophthalmological Society, Coronado, California, April, 1949.

The 100 adult patients studied were observed consecutively during part of January and February 1949. A wide variety of eye, ear, nose and throat disturbances was represented. Routine examination of the nose and throat was done in all cases.

For the cytologic examination, the mucous discharge was collected more often from the pharynx or nasopharynx than from the nose. One specimen was taken from each patient and split so that two or three smears were made from the same specimen. One of the smears was stained and examined by the Hansel technique.[6] The duplicates were stained and examined by other methods.

Records were kept on each patient regarding any family or personal history of allergic reaction, and as to whether there was any complaint of mucus in the throat.

I. *Cause of Drip*

The results of cytologic examination (Table 1) showed that 18 per cent of all patients had nasal eosinophilia. The nasal eosinophilia and neutrophilia were noted a little more often among those complaining of the drip. This indicated only a trend, however, because there were not enough cases to warrant definite conclusion that allergic reaction and infection are related to the complaint of mucus. Moreover, the complaint was subjective; and subjective data may be at variance with physical or laboratory data.

Table 1.—*Relative to Cause of Postnasal Drip*

	No. of Cases	Nasal Eosinophilia	Nasal Neutrophilia
All patients	100	18 (18%)	54 (54%)
Complaining of mucus	50	11 (22%)	34 (68%)
Not complaining of mucus	50	7 (14%)	20 (40%)

Bryant[2] in 1949 emphasized infection and allergic disease as causes of the postnasal drip. Many other causes, including enlarged turbinates, candy eating and subthyroid states, were discussed. In this regard, the records in the present study show that in 14 of the 50 cases in which there was complaint of mucus, the mucus contained neither eosinophils nor neutrophils (see Figure 1). Also the complaint of mucus was only a little more prevalent among patients who had nasal disease than among those with no nasal disease (Table 2). The results of cytologic examination thus suggest that something besides allergic reaction and infection must be looked for to explain the cause of the drip.

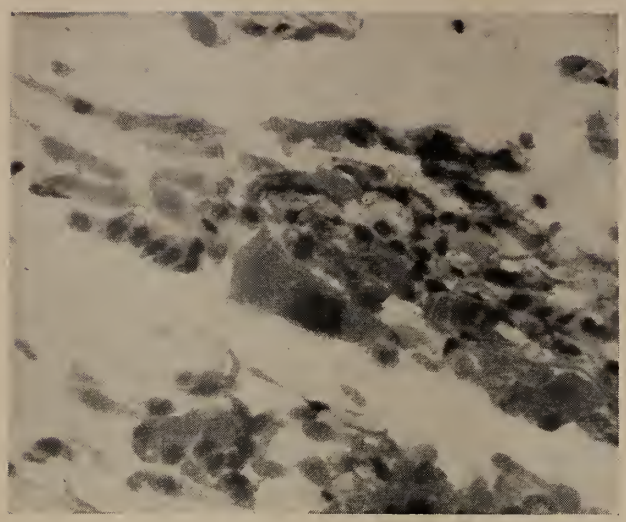

Figure 1.—Typical smear of postnasal discharge of "clear mucus," showing desquamated epithelial cells but no eosinophils or neutrophils.

TABLE 2.—*Relative to the Diagnostic Importance of Eosinophils, Neutrophils and Rhinoscopy and History*

Condition	No. Cases	Nasal Eosinophilia	Nasal Neutrophilia	Complaining of Mucus
No nasal disease	53	3 (5.6%)	16 (30%)	23 (43%)
Nasal disease	47	15 (32 %)	38 (80%)	27 (57%)
History of allergic reaction	38	12 (31 %)	....	....
No history of allergic reaction	60	4 (6.6%)	....	....
No nasal disease or history of allergic reaction	37	2 (5.4%)	....	....

One consideration is the effect that the various psychosomatic stresses to which the individual is so often subjected may have on the nasal mucosa.

Recently, Goodell and Wolff[3] reported two patterns of disturbance of nasal function brought on by emotional stress. Vasoconstriction accompanied fear or grief; hyperemia with hypersecretion accompanied anger and frustration. They reported that, "In a subject with a large gastric fistula, vascular changes in the nose, under a variety of circumstances involving hyperemia or pallor, were found to parallel such changes in the mucous membrane of the stomach."

These nasal changes with increased secretion and production of mucus may in like manner follow disturbances of a physical nature, such as variations in environmental temperature and physical exertion and fatigue.

Under these varied circumstances in the absence of nasal disease, the presence of many pus cells in the postnasal mucus would not be a logical expectation. Yet, repeated or prolonged disturbances with vasoconstrictions and dilatations may often lead to local irritation, inflammation or infection, as was pointed out by Kerr and Lague.[7] Moreover, such disturbances may make nasal allergic disease harder to relieve. On this account, the importance of applied nutrition in improving the quality of the tissues, with consequent increased resistance to environmental stresses, may readily be recognized.

II. *What Patients for Cytological Examination?*

Forty-seven of the 100 patients examined had obvious nasal disease with signs of acute or chronic reactions, and eosinophilia was noted in one-third of these 47 patients. Of the 53 patients with normal-appearing noses, three had nasal eosinophilia (Table 2).

Thirty-eight patients gave histories of allergic disease; eosinophils were noted in the nasal or postnasal discharge of about a third of them. Eosinophils were noted in the smears of only four of the group of 60 patients without history of allergic disease.

There were 37 patients with no evident nasal disease and no history of allergy. Two of these patients had nasal eosinophilia.

As to just what constitutes nasal eosinophilia, the author has been largely guided by Hansel's[6] exposition:

"In view of the irregularity of distribution, it is often not possible to make an accurate evaluation in terms of percentages. We have adopted the plan of recording the cytologic findings in terms of plus-minus, 1+, 2+, 3+, and 4+ eosinophils and/or neutrophils."

The criterion of nasal eosinophilia used in this study, therefore, was the definite presence of more than an occasional eosinophil in one of a dozen or more fields, using magnification of 250. Except for four cases in which the finding was 1+, there was a finding of 2+ or more in all cases recorded as positive for eosinophilia.

In addition to eosinophils and neutrophils the mucus contained epithelial cells of different types, lymphocytes and monocytes. Should these cells be included in the cytologic examination? The answer seems to be no, for the most part.

However, the author is indebted to Benjamin[1] for his report on the presence or absence of monocytes (or mononuclear cells) in the smears in this series. The monocytes, as Sewell and Hunnicutt[9] pointed out, make their appearance predominantly as the acute infection subsides or becomes chronic. Dr. Benjamin found them in 26 per cent of smears of mucus from patients with so-called normal noses and in 50 per cent of smears from patients with nasal disease. Although this disparity in incidence might indicate that the monocytes have diagnostic importance, the cells are difficult to recognize, according to Benjamin and also Small,[10] another pathologist who looked at some of the slides. If, for instance, an epithelial cell loses some of its cytoplasm, it looks like a monocyte.

In one case in this group of 100 patients, a diagnosis of infectious mononucleosis eventually was made. It had been hoped that masses of monocytes could be demonstrated in the postnasal mucus and that a new diagnostic procedure for this disease would be established. However, the mucus contained no unusual number of monocytes.

Yet in the cytology of the drip, cells other than eosinophils and neutrophils must receive some con-

sideration, as something unusual may show up. Hansel[5] reported a case in which all fields were covered with squamous epithelial cells. This led to discovery of a branchial cyst.

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Anuria and Oliguria

Treatment by Conservative Means, Case Report, with Determination of Blood Volume and Na^{24} Space

PART II

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THE principles involved in the therapy of anuria and oliguria which relate to water, electrolyte, and acid-base balance are by no means new. For years they have been the subject of research and publications of J. P. Peters of Yale, of James L. Gamble of Harvard, and of other investigators. Thorn[132] and Bradley[13] recently stressed the importance of these therapeutic principles in the treatment of uremia. The experience of the authors has confirmed the validity of these principles.

It should be emphasized that the treatment outlined here is designed for use in already established anuria. It is not applicable during the induction of anuria by shock or circulatory failure, as these conditions demand treatment directed at augmenting the blood volume or bolstering the circulation. In short, the described treatment presupposes that, despite successful treatment of the circulatory defect or shock, anuria still persists and that time for renal repair must be gained. The value of BAL, particularly in the early phase of heavy metal poisoning, has been amply demonstrated by Longcope and Leutscher[73] and others.

AIMS OF THERAPY

1. Life must be maintained long enough to permit the resumption of kidney function; in most instances this is apparently the time it takes for the damaged renal tubular epithelium to heal.

2. In the absence of renal regulation of electrolyte and water balance and of acid-base control, these regulations must be imposed by taking advantage of the function of the sole remaining regulatory mechanism, the lung.

3. Because of the loss of renal excretory power, medications or drugs dependent on the renal route for their elimination must be given cautiously. Drugs excreted by the biliary or intestinal system or those capable of being metabolized to CO_2 and water are desirable. (See use of digitoxin under *Therapy Relating to the Heart and Circulation.*)

4. Catabolism must be retarded because of the deleterious effect of the accumulation of its unexcreted end-products. Augmentation of catabolic processes induced by vomiting, starving, fever, activity, exercise, etc., must be prevented.

5. In the postanuric phase the patient must be prevented from having a critical loss of fluid and/or electrolytes.

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DIET

Patients are given a diet as high in carbohydrate and as low in fat, potassium, and protein as is palatable (see Appendix). Sodium is restricted in the diet so that it can be more precisely controlled by direct means (infusions, etc.). Carbohydrate is used for its favorable effect in preventing fat and protein catabolism and ketosis, while proteins and amino acids are avoided because of their possible deleterious effects.[95]

Fluids included in the diet must be taken into account in calculating the patient's daily fluid allotment.

The diet is given freely in an effort to approach the caloric needs of a resting person (calculated as 25 calories per kilogram of body weight in adults).

Oral feeding is permitted unless vomiting occurs. When foods and fluids given orally result in continued vomiting, nothing is given by mouth, not even ice chips, for fear of stimulating gastric secretion and vomiting. Parenteral feeding is then resorted to. At this stage no attempt is made to fulfill caloric needs completely. Glucose alone is used for nutritional purposes. Usually only 150 gm. to 200 gm. is given daily,[40] but if the patient is in need of fluids, the opportunity is taken to give as much glucose as the fluid administration by vein will conveniently permit.

The glucose is given in a concentration of 5 to 50 per cent,* depending upon fluid requirements and the routes of parenteral administration available (see Appendix). The favorable effect of 50 per cent glucose in anuria caused by sulfa drugs is noteworthy. If possible, it should be given early in the course of anuria so caused. Parenteral amino acids are not used,[95] and serum albumin or plasma is employed only in special situations in which it is desired to increase circulatory volume.

Vitamin B complex, because of its importance to carbohydrate utilization, and vitamins C and K are employed as dietary supplements. Indications for the use of vitamin K are ill defined, since the prothrombin concentration in anuric patients with ecchymotic tendencies is not always decreased.

*Contrary to general opinion, 50 per cent glucose given slowly does not produce a significant increase in blood volume.[93] With care, the possibility of venous thrombosis usually can be avoided (see Appendix).

DIET THERAPY SUMMARY

1. A high carbohydrate, low protein, fat, sodium, potassium diet, providing 25 calories per kilogram of body weight daily, or more if tolerated, is given.

2. The diet is designed to conform to fluid requirements.

3. If oral feeding is impractical, energy requirements are partially met with glucose, 150 to 200 gm. daily, given in a 5 per cent solution by hypodermoclysis or a 10 to 50 per cent solution intravenously, depending upon fluid needs (see Appendix).

4. Vitamins of the B complex and vitamins C and K are given (see Appendix).

FLUID THERAPY

An attempt is made to keep the patient at his usual preanuria weight. Krupp[62] suggested that the patient with anuria may even be allowed to lose weight, since the oxidation of tissues must of necessity liberate water which, if excretion were normal, would result in weight loss. Since the treatment advocated here imposes an inhibition on catabolism, and since the actual rate of catabolism is not known, the authors are inclined to hold the patient at his usual weight. It can be reasoned further that if catabolism is progressing rapidly, it is better to leave fluid space for the accumulation of wastes. The extreme of this condition, pronounced edema, is undesirable, judging from the number of deaths that occur in the presence of water overloading. On the other hand, if there is doubt about the over-all hydration of the patient, fluid administration to the end-point of minimal edema would seem far safer than the risk of dehydration.

Sufficient fluid should be given daily to replace daily losses. Water loss in the absence of urine formation is mainly insensible (that of respiration and insensible perspiration). Since insensible water loss amounts to 0.6 cc. per kilogram of body weight per hour in normal subjects,[40] only this amount need be replaced in patients with anuria.

Sensible water loss, from perceptible sweating, vomiting, diarrhea, etc., may become excessive. Such loss should be quantitatively replaced with respect to volume and composition (see both *Electrolyte Therapy* and Appendix).

Fluids are given orally as long as possible. If coma or sustained vomiting occurs, fluids are administered parenterally, as described under *Diet Therapy*. If the patient is edematous from overhydration, further administration of fluids may induce cardiac decompensation and pulmonary congestion. In such case, food, which is needed to inhibit catabolism, should be provided with minimal water, as described under *Diet Therapy*.

Because of the efficiency of the large bowel in absorbing water, enemas should not be given without considering the effect they may have on the extracellular fluids (see Appendix for enemas which will not add water).

The use of a single set of accurate balance scales to weigh the patient is essential to adequate fluid management. The bathroom scales ordinarily found in homes are impractical for this purpose as they are frequently inaccurate. If the patient cannot get up, he should be weighed in recumbency with scales such as those suggested by Wangensteen.[139] At the first examination of the patient, a record of his usual weight should be obtained. Subsequent daily weighings should be made as a check upon fluid therapy. If the fluids given cause weight increase, fluids must be further restricted.

Appraisal of fluid balance may be supplemented by the measurement of plasma volume with the dye T-1824 (Evans' Blue). Changes in the measured or assumed plasma volume can thereafter be estimated from a packed cell volume determination, if a constant red cell mass is assumed (see Appendix VII).

FLUID THERAPY SUMMARY

1. Fluid intake is restricted to estimated insensible fluid loss—0.6 cc. per kilogram of body weight per hour.

2. If there is sensible fluid loss, this fluid is replaced quantitatively with respect to volume and composition (see Appendix and *Electrolyte Therapy*).

3. If the patient is edematous from overhydration when first observed, water is withheld until his weight approaches its pre-edema level. Food, and electrolytes if needed, are given with minimal water. If the use of the oral route is contraindicated, hypertonic solutions may be given intravenously.

4. Careful weighing of the patient is essential to adequate fluid management. The weight should not be allowed to exceed the usual weight by very much.

5. Plasma volume and hematocrit studies aid in evaluating fluid balance.

ELECTROLYTE THERAPY

Since in good health both concentration and pattern of extracellular fluid electrolytes are maintained within narrow limits, it is logical to assume that tissues thrive under such conditions. Therefore, an attempt is made to keep the electrolytes as near normal concentration as possible.[109]

The usual patient has had a normal electrolyte concentration and pattern previous to the initiation of anuria. The presence of anuria apparently does not in itself directly alter electrolyte balance. The organism, however, is made hypersensitive to the acquisition or loss of water and electrolyte because adjustment of both depends upon renal control.

There are certain conditions which alter electrolyte balance:

1. If the patient has received large amounts of water, or glucose in water (which contains no electrolytes), the extracellular fluids will be diluted with respect to electrolytes, and water will move into the cells in order to reestablish osmotic pressure relationships.[106, 107]

2. If he has lost fluid from vomiting, a gastrointestinal fistula, sweating, or diarrhea, the patient

will also lose a significant amount of electrolytes.

3. If the patient has received excessive amounts of hypertonic electrolytic solutions either by mouth or parenterally, the concentration of extracellular fluid electrolytes will increase.*[143] Loss of water without loss of electrolytes, as with sweating (providing the sweat is hypotonic) will also increase electrolyte concentration.

If knowledge is unavailable of the losses mentioned, or of acquistion of electrolytes or water, it is possible to make direct measurements. The average hospital laboratory is equipped to measure the serum concentration of the anions HCO_3^- and Cl^-, but it is not equipped to measure cations, such as Na^+ and K^+. Since the electrolyte structure of the extracellular fluids is built around Na, and since increases or decreases of K are so critical, it is highly desirable to measure these cations. If serum sodium cannot be measured directly, a formula devised by Hald, Heinsen, and Peters[46] for the calculation of sodium from serum bicarbonate and chloride can be used (see Appendix). In the authors' experience this formula has been useful, although it may give low values for sodium in anuria due to the accumulation of non-measured acid anions other than bicarbonate and chloride—SO_4, PO_4 and organic acids, for example.

If it is impossible to make direct determinations of the serum potassium concentration, the electrocardiographic changes due to alterations in potassium should be watched for (see *Pathological-Physiological Changes* in Part I).

PRINCIPLES OF ELECTROLYTE THERAPY

As was noted under *Fluid Therapy*, an attempt should be made to maintain the body fluids at their usual volumes. Lost electrolytic fluids should be quantitatively replaced. If body fluids have been made hypotonic because of the administration of non-electrolytic fluids, hypertonic sodium solutions should be given.[107] Since an unknown amount of water will have moved into cells during the period in which the extracellular fluids were hypotonic, the amount of sodium replacement cannot be calculated solely upon the estimated extracellular fluid volume.[107]

The authors are inclined to use sodium in the form of a salt containing an anion capable of being metabolized to CO_2, over which the lung has control, rather than an anion such as chloride over which the lung has no control (see Appendix for fluids used). Strauss,[128] in a footnote, also mentions the beneficial use of hypertonic sodium solutions.

In anuria, regulation of potassium depends on (1) control of potassium intake, and (2) control of catabolism, since tissue breakdown releases potassium into the extracellular fluid. Carbohydrate serves a twofold purpose: It prevents cell catabolism leading to potassium release, and it provides a powerful stimulus to storage of glycogen which takes potassium into cells. Sodium acts in some measure to cause removal of extracellular fluid potassium,[32] as do insulin, epinephrine, and adrenal cortical extract.[34] Since hormonal production apparently is not disturbed in uncomplicated anuria, the authors are not inclined to use hormones. Further, the administration of potassium in the presence of severe renal failure or oliguria would seem to be extremely dangerous and should be done only if careful clinical and laboratory assessment of the need has been made.[26] On the other hand, in the stage of diuresis potassium may be needed, and can be given with less fear of intoxication (see *Treatment During the Post-Anuric Stage*).

Potassium can be removed effectively from the extracellular fluids by intestinal lavage. This is well illustrated in a recently reported case.[83] In the authors' experience it has not been necessary to resort to this measure.

Calcium, which increases cardiac irritability, tends to be beneficial in the presence of potassium intoxication. Because it also tends to antagonize the tetany induced by over-rapid administration of alkaline sodium salts, it can be given to advantage preceding sodium lactate therapy. Because of the synergism between calcium and digitalis, their simultaneous use should be undertaken with caution.[152]

SUMMARY OF ELECTROLYTE THERAPY

1. Hypertonic electrolyte solutions can be given to advantage in some circumstances.
2. The concentration of electrolyte solutions used should be determined by fluid needs as well as by electrolyte needs.
3. Serum sodium and potassium concentrations should be closely followed and kept as nearly normal as possible.
4. If facilities for measuring serum sodium and potassium are lacking, sodium may be estimated from serum bicarbonate and chloride, and potassium levels may be judged from the electrocardiographic pattern.

ACID-BASE CONTROL

When the kidneys are incapable of regulating acid-base balance, the burden falls entirely upon the lungs. Because the lungs control acid-base balance through the regulation of carbon dioxide loss, diet and electrolyte administration are designed to take maximum advantage of this ability. Since anions other than HCO_3^- (Cl^-, SO_4^{--}, PO_4^{---}, etc.) depend upon the renal route for excretion, their intake is cut to a minimum. They are replaced largely by HCO_3^- over which the lung can make adjustment. The lungs, by maintaining the ratio of H_2CO_3 to $NaHCO_3$ at 1:20, are thereby able to resist changes in the pH of the body fluids.[40]

Maintenance of normal acid-base relationship consists of: (1) administration of the optimum amount of carbohydrate needed to retard fat and

*In the absence of renal function, the administration of a balanced electrolytic solution, such as Tyrode solution or 0.9 per cent sodium chloride, does not change electrolyte concentration appreciably, since the solution expands the extracellular fluid volume without changing its concentration.

protein catabolism, both of which result in acid metabolites demanding renal excretion; (2) administration of replacement electrolytes largely in the form of Na^+ combined with an anion capable of giving rise to CO_2, over which the lung has control (for example, $NaHCO_3$ or Na lactate. See Appendix). As mentioned under Electrolyte Therapy, sodium is given only if there is depletion.

THERAPY RELATING TO THE HEART AND CIRCULATION

In anuria, the differentiation of either hypoproteinemia or congestive heart failure from water overloading is difficult. On the one hand, water overloading produces signs, such as liver engorgement and pulmonary edema, indistinguishable from signs of heart failure, and on the other hand, causes an increase in plasma volume[76, 140] with dilution of previously normal serum protein concentrations. Pulmonary edema, whatever the cause, may threaten life.

The authors are inclined to give digitalis to the patient when there is any question of heart failure. Parenteral administration is used to insure accurate dosage. The authors have used digitoxin, giving 1.2 to 1.5 mg. in the first 24 hours and 0.1 to 0.2 mg. daily thereafter. With this dosage there has been no apparent intoxication.

Phlebotomy (500 to 800 cc.) and artificial phlebotomy (using venous-occluding cuffs on the extremities) has been resorted to when indicated. On occasion when overhydration was present, cell mass has been used instead of whole blood in order not to overexpand the blood volume, and yet to maintain the high oxygen carrying capacity of the blood. Aminophylline has been used for its favorable effect on bronchial spasm. (Since aminophylline is detoxified to urea, the authors have not been averse to using it.) The use of oxygen, especially with intermittent positive pressure breathing as described by Cournand and co-workers[24] and Motley and his co-workers,[90] has been helpful in combating pulmonary edema. Prolonged positive pressure breathing, however, is liable to be deleterious.

SUMMARY OF THERAPY OF HEART AND CIRCULATION

1. In anuria, it is difficult to differentiate congestive heart failure from simple water overloading.
2. Full digitalization followed by maintenance dosage seems well tolerated in anuria.
3. Both bleeding and bloodless phlebotomy with red cell replacement are useful.
4. Aminophylline may be used to advantage.
5. Oxygen therapy and intermittent positive pressure breathing are useful.

DIURETICS

In anuria of lower nephron nephrosis, the kidney is peculiarly unable to respond either to the substances which commonly stimulate diuresis or to special agents used for this purpose. Water, which in the normal subject is one of the best diuretic agents, is ineffective. Urea, commonly useful, fails even when very high blood levels are present. The ineffectiveness of acidosis is illustrated by the fact that although anuric patients frequently become acidotic, diuresis does not coincide. Consequently, the use of acidifying salts, such as ammonium chloride, sodium sulfate and the nitrates, is contraindicated. Sodium and potassium, normally powerful diuretics, fail in anuria and should be used only to fulfill their function as electrolytes. Mercury, because of its ability to produce tubular damage, appears particularly contraindicated. Xanthines logically can be used, but have proved disappointing.

SUMMARY OF DIURETICS

1. The usual diuretics are contraindicated in oliguria and anuria, with the exception of xanthines.

CONVULSIONS

The identity of the agent or agents responsible for convulsions in uremia is obscure. Convulsions are not related directly to blood urea concentration. Sodium depletion (water intoxication)[48, 118, 119] is a well-known cause of convulsions and is accompanied by cerebral edema. Since sodium depletion is often induced in the presence of anuria, it would seem likely that it is responsible for some of the convulsions in anuric patients. Lattimer[67] has commented on the fact that cerebral edema frequently accompanies anuric uremia with convulsions. (The principles of sodium replacement and the indications for using hypertonic solutions have been discussed under *Principles of Electrolyte Therapy*.)

The authors have attempted to anticipate convulsions by watching patients for the hyperreflexia and involuntary muscle jerks which often precede a convulsion. The authors use those anticonvulsant agents which are mainly dependent on the liver or lung for excretion, such as evipal, amytal, pentobarbital, or paraldehyde, and avoid anticonvulsants with strong respiratory depressant action since respiration is so important to the adjustment of acid-base balance. Anticonvulsants, hypnotics, or sedatives requiring renal excretion, such as parenteral magnesium sulfate, chloral hydrate, phenobarbital, should be used sparingly, if at all.

TREATMENT DURING POST-ANURIC STAGE

Resumption of urine flow may be gradual, or it may be sudden. With diuresis, clinical improvement is often spectacularly rapid, but it may be followed within a few days by a rapid decline, characterized by asthenia, prostration, and shock leading to death. This decline tends to be accompanied by massive urine output with specific gravity in the neighborhood of 1.010. Rapid replacement of fluid and electrolytes given in isotonic concentrations has led to dramatic symptomatic and clinical improvement.

Continued weighing of the patient and replacement of fluid to maintain his usual weight provides a good method of following him at this stage, since a sudden gain in weight following the administra-

tion of isotonic, sodium-containing fluids indicates that fluid and electrolyte needs have been more than met. In one case observed by the authors, although large sodium replacement was made without weight gain (36 grams of NaCl as 0.9 per cent solution daily), the patient lapsed into coma. He was revived and ultimately recovered following parenteral potassium therapy.

CASE REPORT

This case report is presented to illustrate the conservative treatment advocated.

The patient, a white male, aged 55 years, had oliguria and a lower nephron lesion which developed following a second transurethral resection. Presumably, the lesion was related to overly sustained hypotension and to the entry of sterile distilled water into the prostatic venous plexus when the pressure of the wash water exceeded venous pressure, as is frequently the case in the transurethral procedure.[65]

Nov. 21, 1948: The patient was admitted to the urological service of the University of California Hospital for transurethral resection of a benign hypertrophied prostate. On admission, the temperature was 36.0°C., weight 87.5 kilograms, height 193 centimeters, pulse 80, blood pressure 128 mm. of mercury systolic and 78 mm. diastolic. Aside from the hypertrophied prostate, there were no noteworthy physical findings. The blood Kahn and Kolmer tests were negative. Urinalysis showed pH 5.5, specific gravity 1.005; no reduction, proteinuria, or acetoneuria. Microscopic examination of the centrifuged urine revealed rare hyaline casts and 1 to 2 erythrocytes and leukocytes per high dry field. In subsequent examinations of urine the findings were characteristic of transurethral resection and a moderately severe lower nephron lesion. Other laboratory data will be found in Tables 3 and 4 and Figure 2.

Nov. 22, 1948: T. 36.6°C. The patient was well hydrated previous to initial transurethral resection.

Nov. 23, 1948: T. 38.8°C. Resection was begun under pontocaine spinal anesthesia. The procedure was discontinued one-half hour later because of excessive bleeding and mild circulatory shock. The patient was given a transfusion of 500 cc. of type-specific cross-matched blood and was returned to the ward.

Nov. 24, 1948: T. 37.8°C. The patient looked well. Packed cell volume was 40 cc. per cent; fluid intake was 3,800 cc.; urine output, 2,600 cc.

Nov. 25, 1948: T. 39.1°C. Fluid intake was 2,890 cc.; urine output, 3,900 cc.

Nov. 26, 1948: T. 38.6°C. There was right costovertebral angle tenderness, possibly due to pyelonephritis. The fluid intake was pushed to 4,600 cc. The urine output was not recorded.

Nov. 27, 1948: T. 37.9°C. The fluid intake was pushed to 6,450 cc. The urine output was 5,800 cc.

Nov. 28, 1948: The costovertebral angle tenderness had disappeared. The fluid intake was 4,300 cc.; urine output, 3,650 cc.

Nov. 29, 1948: T. 37.8°C. The patient was taken again to surgery and 50 gm. of prostatic tissue was removed by transurethral resection under spinal pontocaine anesthesia. A transfusion of 250 cc. of type-specific cross-matched whole blood was given. The transfusion was discontinued when a mild chill developed. It was not thought that the patient had a transfusion reaction. The lowest blood pressure recorded during operation was 85 mm. of mercury systolic and 70 mm. diastolic. After return to the ward, the patient had profuse bleeding of unknown amount requiring traction to control it. The fluid intake was 4,900 cc.; urine output, 4,000 cc.

Nov. 30, 1948: T. 37.3°C. There was much nausea and vomiting. The fluid intake was 3,250 cc.; output, emesis, 550 cc.; urine, 1,100 cc.; a total of 1,650 cc. The packed cell volume was 34 cc. per cent.

Dec. 1, 1948: T. 37.8°C. Nausea and vomiting continued. The fluid intake was 1,000 cc. of 5 per cent glucose and 100 cc. of normal saline, both intravenously, and 1,100 cc. orally, a total of 3,100 cc. Oliguria started. (Subsequent data are included in Table 3.)

Dec. 2, 1948: T. 37.8°C. The patient was doing poorly. Nausea and vomiting continued. The oliguria regimen was begun. Because of the vomiting, all food, medication, and fluids by mouth were discontinued. It was decided that the patient was mildly overhydrated and that body weight should be maintained at about 80 kg. Because the serum sodium content was depressed, 100 cc. of 1 M. sodium lactate was given in addition to the liter of 5 per cent glucose that had been given before the oliguria regimen had begun.

Dec. 3, 1948: T. 37.4°C. Blood pressure was 140 mm. of mercury systolic and 80 diastolic. Nausea and vomiting continued. No peripheral or pulmonary edema was noted. Heart sounds were of good quality. Fluid allotments were planned to meet the patient's needs. Sodium replacement was continued.

Dec. 4, 1948: T. 37.4°C. Blood pressure was 140 mm. systolic and 75 mm. diastolic. Nausea and vomiting had stopped. The patient was looking slightly better.

Dec. 5, 1948: T. 37.5°C. Blood pressure was 140 mm. systolic and 70 mm. diastolic. The patient had no nausea or vomiting but complained of headache, which was relieved with codeine (aspirin was not given because of renal failure). The heart sounds were good, the lungs clear, the liver not enlarged. Edema was not clinically perceptible.

Dec. 6, 1948: T. 37.5°C. Blood pressure was 145 mm. systolic and 70 mm. diastolic. Physical signs were unchanged. An electrocardiogram was reported as normal, with no evidence of potassium intoxication. The patient complained of headache again, especially when he read too much.

Dec. 7, 1948:. T. 37.1°C. The patient had headache with some nausea and slight vomiting, but was mentally clear. He sat in a chair for 15 minutes. Since the serum sodium content was still depressed, the needs were met with 200 cc. of 1 M sodium lactate.

Dec. 8, 1948: T. 36.8°C. No essential change. An enema was given (see Appendix).

Dec. 9, 1948: T. 37.1°C. No essential change. An electrocardiogram was normal. Blood ketones measured as acetone were 6.7 mg. per 100 cc. Unfortunately the specimen for computation of ketones was taken one-half hour after 150 cc. of 50 per cent glucose had been given intravenously.

Dec. 10, 1948: T. 37°C. No essential change. The patient read without complaining of headache. Blood volume studies were done without apparent ill effects. Oral fluids were reinstated. Subsequently, however, when the patient could not meet total fluid needs orally, intravenous supplements were given.

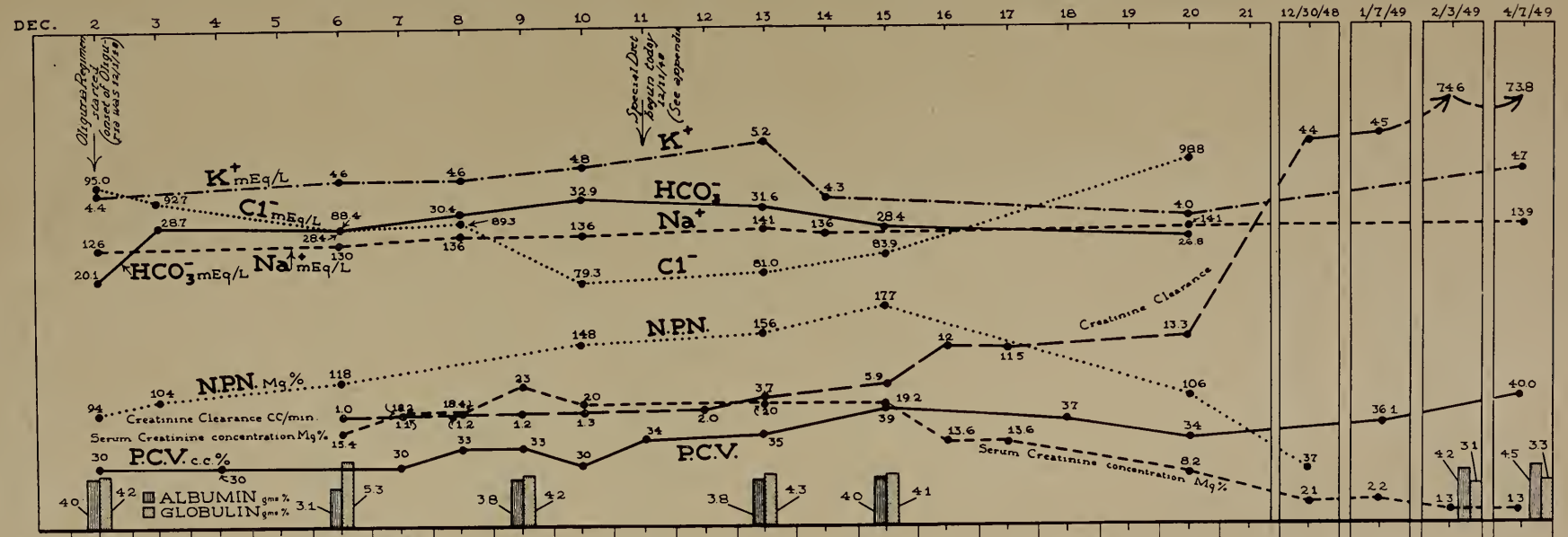
Dec. 11, 1948: The patient felt reasonably well. A special diet (see Appendix), providing 720 calories, was tried and was well tolerated. To compensate for the urinary loss of sodium, 500 cc. of normal saline was provided.

Dec. 12, 1948: T. 37.1°C. The blood pressure was 150 mm. of mercury systolic and 90 mm. diastolic. The lungs were clear. First heart sounds were reduplicated at the apex. The patient ate well (1,180 calories) and retained the food. Again, 500 cc. of normal saline was provided to compensate for urinary loss of sodium.

Dec. 13, 1948: T. 37°C. The patient was unable to eat dinner because of nausea. Diuresis started. The patient was now in excellent sodium balance.

Dec. 14, 1948: T. 37°C. The patient dangled his legs over the edge of the bed for 15 minutes; sat in a chair for 15 minutes.

TABLE 3.—*Fluid Balance and Blood Chemical Changes During a Case of Lower Nephron Nephrosis*



INTAKE	500B 100ML 1000D5/W 200D10/W	1000 % L 100D10/W 10 C.C	400B 150D20/W 150D50/W 150D50/W	500D20/W 500D40/W 500D40/W	150D20/W 1000D40/W 50N.S.	500B 50N.S. 10 C.C. 150D20/W 500D40/W 50D50/W 200ML	1250D20/W 500D40/W 50N.S. 10 C.C.	300D40/W 500D40/W 50N.S.	500D40/W 150D40/W 700F.	500B 500D40/NS 150 S3 150D20/W 800F.	500D20/NS 1200F. FOOD	500D20/W 150D40/W 1200F. FOOD	500D20/W 1350F. FOOD	1400F. FOOD	2505F. FOOD	2230F. FOOD	2250F. FOOD	1700F. FOOD	3050F. FOOD	3250F. FOOD
TOTAL INTAKE	1800	1110	850	1500	1200	1460	860	850	1350	2100	1700	1850	1850	1400	2505	2230	2250	1700	3050	3250
LOSSES URINE	300	210	175	175	210	240	350	400	480	650	800	1200	1800	2000	2580	2645	2200	1600	2450	2450
LOSSES VOMITUS	1100	50	0	0	0	125	0	0	0	0	0	200	50	0	0	0	0	0	0	0
LOSSES INSEN LOSS	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
TOTAL LOSS	2600	1460	1375	1375	1410	1565	1550	1600	1680	1850	2000	2600	3050	3200	3780	3845	3400	2800	3650	3650
FLUID BAL.	-800	-350	-525	+125	-210	-105	-690	-750	-330	+250	-300	-750	-1200	-1800	-1275	-1615	-1150	-1100	-600	-400
WEIGHT K	81.8	81.0	81.5	81.0	80.8	80.6	80.8	80.8	79.5	—	80.0	81.3	80.0	78.3	78.3	77.8	75.5	75.5	76.3	76.3	80.3	83.5	86.5

Fluid balance given above represents the difference between measured fluid intake and insensible plus sensible fluid loss (urine and vomitus). As there was only one bowel movement by enema from Dec. 2, 1948, to Dec. 21, 1948, fluid loss by this means is not included in the balance figures. Because blood fulfills a special circulatory function as opposed to subserving fluid exchange from within to outside the body, it does not properly enter into the calculations of fluid exchange. Since it is reflected necessarily in the weight changes of the body, it has been included in the fluid exchanges. Water created from the combustion of administered food was not calculated into the fluid exchanges, as this seemed an excessive refinement inconsistent with the crudity of other measurement in this study.

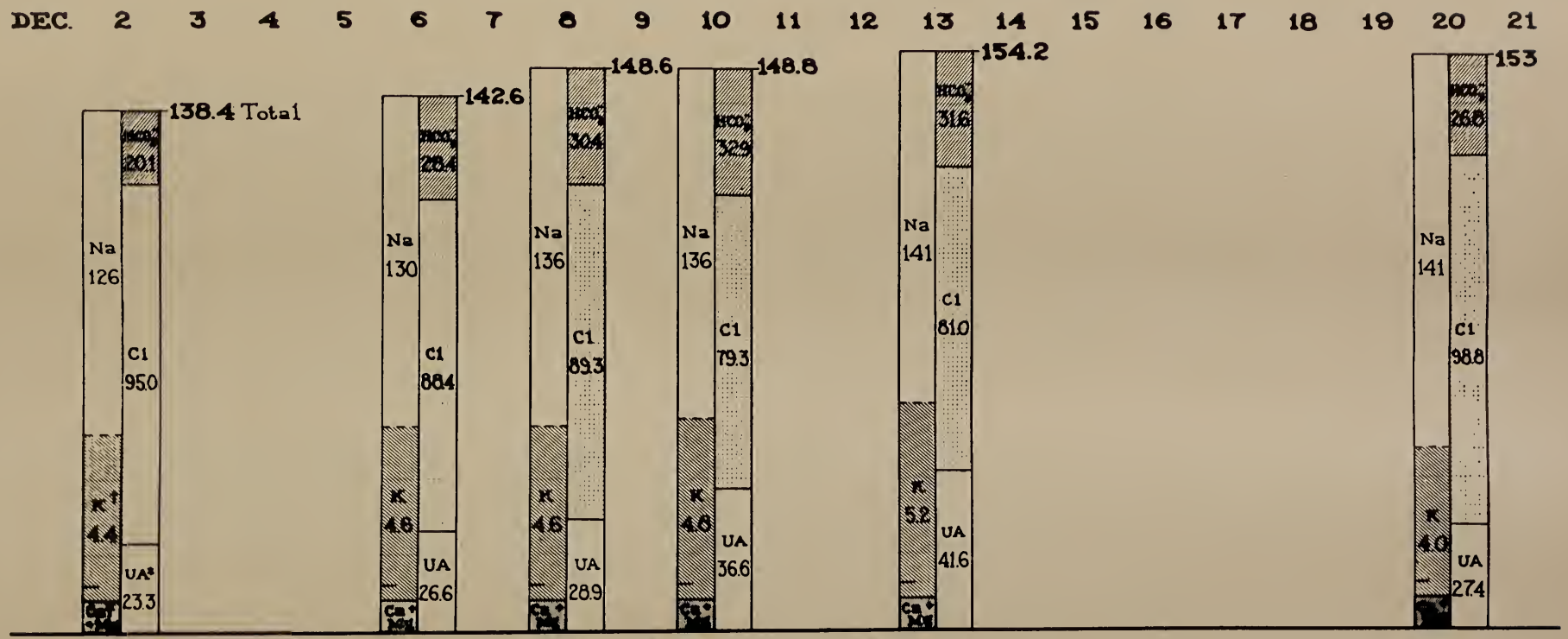
ABBREVIATIONS USED

N. S.—Normal saline (physiological)
D_5/W—The number designates the per cent concentration of dextrose in water (W); thus D_5/W is 5% dextrose in water, D_{10}/W is 10% dextrose in water, etc.
D/NS—Dextrose in normal saline
M.L.—1 molar sodium lactate
M/6 L—1/6 molar sodium lactate
F.—Fluids by mouth
C.G.—10% calcium gluconate

NORMAL VALUES FOR THIS LABORATORY

Serum albumin	4-5.5 gm.%
Serum globulin	1.5-3.5 gm.%
Total proteins	6-8 gm.%
Serum chloride (Cl^-)	99.5-106.5 meq./l
Serum creatinine	0.6-1.5 mgm.%
Endogenous creatinine clearance	105 cc./min.
	72-140 cc./min.
Serum potassium (K^+)	3.8-5 meq./l
Serum sodium (Na^+)	138-144 meq./l
Nonprotein nitrogen (NPN)	25-40 mg.%
Packed cell volume, (PCV):	
Men	47 ± 7 cc.%
Women	42 ± 5 cc.%

FIGURE 2.—*Serum Electrolytes in Case of Lower Nephron Nephrosis. (Adapted from Table 3.)*



All figures in electrolyte columns are expressed in meq/l of serum

** Electrolytes administered during therapy expressed in meq. Loss of electrolytes in urine, emesis, etc., not measured

† Potassium column is magnified 10 times so that changes in K are more easily appreciated

* UA = Calculated unmeasured acids

‡ Ca and Mg not measured. Assumed to be constant at Ca (5) + Mg (3) = 8 meq/l

TABLE 4.—*Circulation and Extracellular Fluid*

Wt. 78.3 Kg. Ht. 193 Cm.							
Date	P.C.V. cc. %	Blood Vol. cc.	Plasma Vol. cc.	Cell Vol. cc.	Extracellular Fluid Vol. cc.	C.T.	V.P.
Dec. 10, 1948	31.5	*6950	4760†	2190		21	6.5
		*6240	4270	‡1970			
Dec. 15, 1948					§24.5 L		
Feb. 3, 1949	36.1	*6820	4360	‡2460			

*Note that the given blood volumes were calculated from the red cell volume and hematocrit in the case of the CO method, and from the plasma volume and plasmacrit in the case of the dye method.

†Cell volume measured with carbon monoxide.

‡Plasma volume measured with the dye T-1824.

§Extracellular fluid was measured with radioactive sodium (Na_{24}). 24.5 liters is 31% of 78.3 kg., the patient's body weight on this day.

C.T.: Circulation time in seconds measured with 5 cc. of 20% Decholin (arm to tongue).

V.P.: Venous pressure measured from a reference point 5 cm. beneath the sternal angle.

Dec. 15, 1948: T. 36.8°C. The patient sat in a chair for 15 minutes. Measurement of extracellular fluid volume was made (see Table 4).

Dec. 16, 1948: T. 36.8°C. Further improvement was noted. The patient was able to get up for short periods, although he still felt weak. Sodium chloride, 1 gm. three times a day, was given orally to compensate for continued urinary loss.

Dec. 17, 1948 through Dec. 21, 1948, the day of discharge: The patient was ambulatory. Although he was not strong, he felt well. Physical examination revealed no thromboses as a result of intravenous therapy. The blood pressure was 170 mm. of mercury systolic and 95 mm. diastolic but fell to 145 mm. systolic and 80 mm. diastolic on the day of discharge. Because the patient was a vegetarian, no special diet was prescribed. Except for that, however, a special diet would have been ordered until it was obvious that renal function had returned to the point where protein could be handled adequately. Often protein can be increased rapidly. Iron was prescribed, as well as sodium citrate (3 gm.) and sodium chloride (3 gm.) daily to assure sufficient sodium to compensate for renal loss.

OUTPATIENT CLINIC NOTES

Dec. 30, 1948: Blood pressure was 150 mm. of mercury systolic and 95 mm. diastolic. The patient was gaining strength, felt well, and was able to be mildly active. A gain in weight (see Table 3) was reflected in edema of the legs. Because sodium intake had surpassed ability to excrete it renally, water retention had been caused. Accordingly, sodium was discontinued. Renal function had greatly improved (see creatinine clearance in Table 3).

Jan. 7, 1949: Edema was subsiding.

Feb. 3, 1949: The patient, working in a laundry, complained of tiring easily. Creatinine clearance had improved.

April 7, 1949: There were no complaints, and fatigue had lessened. There was no further change in creatinine clearance. Packed cell volume was now near the normal (see graph in Table 3).

Oct. 6, 1949: Blood pressure was 150 mm. of mercury systolic and 90 mm. diastolic. The body weight was 90 kg. Specific gravity of the urine was 1.020; albumin, 1 plus; an occasional erythrocyte and one leukocyte per high dry field was noted. There was one coarse granular cast per low power field. Creatinine clearance was 94.3 cc. per mm. The patient looked very well and had good muscle tone.

DISCUSSION

Symptomatically, the patient had a relatively uneventful course. The vomiting which accompanied the onset of oliguria was brought rapidly under control by discontinuing oral feeding and medication. Sodium depletion was not vigorously combated but was brought slowly back to normal. The authors are inclined to meet sodium requirements gradually, thereby avoiding the risk of suddenly overloading the circulatory volume.

Potassium concentration was maintained at below toxic levels by restricting potassium intake and by following measures known to induce potassium storage and to decrease catabolism.

Fluid intake was restricted to amounts calculated to prevent gain in weight. Although this was done, it is of interest that sodium space measured with Na_{24} increased to 31 per cent of body weight (normal, 20.8 to 28.7 per cent; average, 24.8 per cent[58]). That sodium space was expanded was further suggested by the rapid fluid and weight loss with the onset of diuresis. Further, the blood volume did not share in the expansion of extracellular fluids, as it was within normal limits both during and after recovery from oliguria. It does not follow, however, that blood volume will always be static with an expanding extracellular fluid volume.[76, 140]

Ketosis and acidosis were combated by administration of carbohydrate. The lung was able to impose its regulation upon acid-base balance and did so by restraining CO_2 loss as is evidenced by a rising HCO_3^-. No particular attention was paid to the falling chloride, since the lung was able to substitute the anion HCO_3^- for Cl^- by restraining CO_2 loss. The accumulation of other anions was an unknown quantity but could be roughly estimated from the difference between serum sodium and $HCO_3^- + Cl^-$. No clinical signs of alkalosis developed. The endogenous creatinine clearance appears to be a far better index of renal function than the direct measurement of any of the non-protein nitrogen components of the blood.

APPENDIX

I. Water liberated by the combustion of fat, protein, and carbohydrate:[110]

1 gm. fat	1.077 cc. water
1 gm. protein	0.396 cc. water
1 gm. carbohydrate	0.556 cc. water

II. Formula for calculating serum sodium from serum bicarbonate and chloride[46] and factors for converting mgm. and volume per cent to milliequivalents.

$Cl^- + 23.2 + (0.5\ HCO_3^-) = Na$, all expressed in meq./l Convert serum Cl^- expressed as mg. per cent NaCl to meq./l of Cl as follows:

$$\frac{\text{mg. \% NaCl}}{5.85} = Cl^- \text{ meq./l}$$

Convert *serum* or *plasma* CO_2 capacity or combining power in volumes per cent as follows:

$$\frac{\text{vol. \% } CO_2}{2.3} = HCO_3^- \text{ meq./l}$$

III. Fluids for parenteral use

A. Hypertonic fluids for electrolyte *replacement* for intravenous use only; must be given slowly, preferably by drip. (See D. 2, following, for statements applying to hypertonic solutions.)

1. NaCl solution, 3 to 6 per cent, usually given in amounts of 100 to 200 cc. (100 cc. 6% = 100 meq. of sodium).
2. One molar sodium lactate usually given in amounts of 100 to 200 cc. (166 cc. 1 molar sodium lactate provides the amount of sodium in 1 liter of 1/6 sodium lactate, while 1,000 cc. of 1 molar sodium lactate provides 1,000 meq. of sodium, equivalent to 58.5 gm. NaCl).

B. Solutions used for potassium *replacement*

1. From Govan and Darrow[44]

KCl	2 gm.
NaCl	3 gm.
1 M. Na lactate	40 cc.
Water	710 cc.
Total	750 cc.

This is given very slowly intravenously, taking 2 hours in an adult. Danowski et al.[26] gave KCl at the rate of 1 gm. per hour parenterally to diabetics.

2. Tarail and Elkington[131] administered potassium parenterally as K_2HPO_4 and KH_2PO_4 in molar ratio of 3.55 to 1. These potassium salts added to the other intravenous fluids, such as glucose, in concentrations up to 70 meq. per 1 were given slowly at a rate not in excess of 20 meq. per hr.
3. Parenteral potassium therapy must be given slowly to avoid the dire consequences of toxic concentrations. Whenever possible, potassium should be given by mouth in preference to parenterally.

C. Isotonic fluids used for electrolyte *maintenance*

0.9 per cent NaCl solution (normal saline)
1/6 molar sodium lactate
May be given intravenously, intramuscularly, or subcutaneously.

D. Fluids used for caloric value

May be isotonic or hypertonic with respect to blood cells. Once within the body they diffuse rapidly, diluting electrolytes in both extracellular and intracellular fluid compartments.

1. Five per cent glucose in water
Use intravenously, intramuscularly, or subcutaneously.
2. Ten to 50 per cent glucose
Use intravenously only. If very hypertonic, it should be given slowly by drip. The arm may be be elevated and heated to insure rapid blood flow, thereby lessening the chance of venous thrombosis. Fifteen per cent glucose recommended by Thorn[132] and others can be exceeded in concentration since renal spillage does not occur in anuria.

IV. Recommended non-absorbable enemas

A. Mineral oil or vegetable oil retention enema
B. Magnesium sulfate ..... 30 gm.
Glycerin ..... 60 cc.
Water q.s. ad ..... 150 cc.

V. Recommended daily vitamin therapy

Synthetic vitamin K ..... 1–2 mg.
B_1 (thiamine) ..... 10 mg.
B_2 (riboflavin) ..... 5 mg.
Nicotinic acid ..... 100 mg.
Ascorbic acid ..... 200 mg.

VI. Recommended special diet

High carbohydrate, low protein, fat, potassium, and sodium diet. Both fluid and sodium are kept low (since sodium is controlled by fluid administration). Protein and fat are kept as low as palatability permits. Slowly available carbohydrate is given in large amounts, whereas quickly available carbohydrate is kept low to avoid gastrointestinal irritation and possible vomiting. The diet contains approximately 1,400 calories which should maintain the average normal subject's weight at bed rest. Gas-forming fruits and vegetables are avoided because of the discomfort or nausea they may cause. The nature of the diet is regular rather than soft or bland, since it has been found that patients who tend to be nauseated often prefer the "natural" kinds of food.

SPECIAL DIET

Food	Grams	Protein	Fat	Carbohydrate	Mg. K	Mg. Na.
Breakfast:						
White bread	30	3	—	16	32	201
Farina (30 gm. dry) cooked	200	3	—	21	36	33
Butter	20	—	16	—	2	196
Cream	30	1	6	1	18	12
Sugar	10	—	—	10	—	—
Sliced oranges or grapefruit	100	1	—	10	181	—
Dinner:						
Choice of:						
Asparagus (canned)	100	1	—	5	130	400
Tomatoes (canned)						
Green beans (canned)						
Beets (canned)						
Peas (canned)						
Rice (no salt)	100	1	—	20	22	—
Lettuce	40	—	—	3	124	2
Mayonnaise	10	—	8	—	2	60
White bread	20	2	—	11	22	134
Butter	15	—	12	—	2	147
Choice of:						
Applesauce	100	1	—	20	55	2
Peaches (canned)						
Blueberries (fresh or canned)						
Supper:						
Choice of:						
Peas (fresh)	100	1	—	10	284	5
Winter squash (fresh)						
Tomatoes (raw)						
String beans (fresh)						
Macaroni (no salt)	100	1	—	20	60	1
White bread	20	2	—	11	22	134
Butter	20	—	16	—	2	196
Choice of:						
Pears (canned)	100	1	—	20	129	8
Apricots (canned)						
Strawberries (fresh)						
Huckleberries (fresh)						
Choice of:						
Pineapple (canned)	100	1	—	20	214	1
Plums (canned)						
Raspberries (fresh)						
Loganberries (fresh)						
	—	—	—	—	—	—
		19	58	198	1.34	1.43

Calories 1,390

No added salt (it is controlled through medication).
Fluid is added as requirements demand.

VII. Estimation of blood volume changes

$$\text{Blood volume}_1 = \frac{CV}{Hct_1}$$

Assuming a constant CV then

$$\text{Blood volume}_2 = \frac{CV}{Hct_2}$$

Where CV is the absolute or total cell volume whose magnitude is either measured or assumed.

Where Hct_1 is the initially determined hematocrit.

Blood volumes 1 and 2 are initial 1 and final 2.

See reference 41 for estimation of total cell volume.

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CASE REPORTS

Allergic Sinusitis Treated as a Deficiency Disease
Barnyard Fowl as a Source of Human Ornithosis

Allergic Sinusitis Treated as a Deficiency Disease

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ALTHOUGH sensitivity to allergens is of course the immediate cause of allergic rhinitis and allergic sinusitis, the sensitivity itself may be but a symptom of chemical imbalance arising from dietary deficiency.[1]

It is felt that too often the treatment of allergic disease is directed at superficial desensitization or to avoidance of contact with allergenic agents, and that not enough consideration is given to the discovery and reversal of more abstruse underlying conditions which might account for the sensitivity. For this reason, in the treatment of a patient with allergic disturbance of the nasal passage or sinuses, careful study should be made of the dietary intake over an extended period, with special attention to deficiencies in minerals and nutrients such as vitamins and proteins.

In this regard, the author has previously reported several cases[1] in which patients with frequent colds and sinusitis were considerably improved following courses of prescribed diets supplemented with extra vitamins in large quantity to overcome deficiencies which had been discovered.

The following two additional case reports are pertinent:

CASE 1: The patient, a male, 54 years of age when first observed in April 1948, had had intermittent attacks of sinusitis since 1917. In 1925 an operation had been done for correction of deviation of a septum. Following a severe attack of sinusitis in 1945, with nasal discharge in large quantity, tests for allergic reaction were carried out, and the patient was found to be sensitive to a number of pollens and foods as well as to dust and mold. A diet to eliminate the food allergens was prescribed and injections of the indicated antigens were given twice a week. The injections were still being given when the patient consulted the author in 1948.

The patient was undernourished as indicated by the fact that he was 71½ inches tall and weighed only 142 pounds. Examination of the nose showed edema of the mucous membrane and excessive secretion, interpreted as evidence of allergic rhinitis.

X-ray studies showed density in both antra but no evidence of bone destruction.

Upon examination of the blood, erythrocytes were found to number 4,900,000 with a hemoglobin value of 75 per cent; leukocytes numbered 10,000 with a normal distribution. The cholesterol content of the blood was 326 mg. per 100 cc. Numerous pus cells and many Gram-positive cocci arranged in groups and chains were noted in examination of a smear of nasal secretion.

The patient was referred for a dietary survey and the report was that the diet appeared to be adequate despite the elimination of supposed allergens. (It should be noted, however, that the appraisal of the diet was made on the basis of information elicited from the patient, and it was not learned until some time later that, in replying to questions, the patient had considered only the diet he then was following, which had been prescribed. Hence the survey inadvertently did not take into account the long-time eating habits of the patient.)

In view of the fact that nasal discharge did not abate and the patient was underweight, additional nutrients and vitamins were prescribed despite the favorable dietary report. Vitamin A (150,000 units), vitamin C (750 mg.) and three vitamin tablets* were given daily for one week. As the patient still had constant stuffiness in the nose at the end of that time, 300 mg. of nicotinic acid was added to the daily dosage. In two days the nose was entirely open and the amount of discharge was greatly reduced. The dosage was continued for the next two months and the improved status of the patient was maintained. At this time the dosage was cut to one-third the former level and nasal discharge increased within the next five days. When the previous dosage schedule was resumed, improvement again followed and was maintained for several months. Subsequently when an acute flare-up occurred, it was learned that shortly before this attack the patient had neglected to take the nicotinic acid and had eaten a dozen pieces of chocolate, to which he was known to have allergic sensitivity.

It was reported that the left antrum was found to contain foul-smelling pus. After repeated lavage with instillation of penicillin and micro-crystals of sulfathiazole, and penicillin systemically, the amount of discharge decreased. When the penicillin given systemically was stopped and the frequency of lavage was reduced, pus formation recurred. A Caldwell-Luc operation was done. The antrum was full of pus and polypoid mucous membrane. The membrane was entirely removed and an opening was made in the inferior meatus of the nose. Three days later the discharge had almost entirely subsided.

Nine months later there had been no recurrence of heavy discharge.

COMMENT

From the outset of treatment in this case it was hoped that supplying needed nutrients in large quantity might abate the severe sinusitis and obviate operation. In this regard the improvement following the giving of supplemental vitamins and nicotinic acid in large quantity was encouraging. As operation at last was necessary, however, it is probable that it would have been better to have opened the antrum earlier. A possibility to be considered, however, is that conservative treatment might have availed had the pathologic change not been so firmly established.

CASE 2:† When first observed the patient, a woman 63 years of age, had been taking Theominal® (luminal and theobromine), three tablets daily in divided doses, which had

*Each tablet contained: Thiamine chloride, 3 mg.; riboflavin, 5 mg.; pyridoxine, 1 mg.; pantothenic acid, 10 mg.; nicotinic acid, 10 mg.; choline, 30 mg.; inositol, 30 mg.; dry yeast powder, 240 mg.

†Case reported to the author by David Boody, M.D.

been prescribed by a physician a month previously because of blood pressure of 240 mm. of mercury systolic and 150 mm. diastolic with complaint of headache, dyspnea, orthopnea, palpitation and nocturia.

The patient said she had had "hay fever" intermittently over a 15-year period and that attacks were initiated by change of temperature and exposure to pollens and dust but were not caused by change of seasons or foods. Episodes were characterized by profuse watery nasal discharge, sneezing, stuffy nose and mild dyspnea. Attacks occurred twice or thrice weekly and lasted two or three days. Tonsillectomy and submucous resection had been done ten years previously. Local treatment of various kinds had given temporary relief. Dyspnea and palpitation had subsided, the patient said, since she had begun to take Theominal.

Upon examination the nasal membranes were found to be pearly gray and boggy. Bilateral edema of the middle turbinate was noted. There was seromucoid discharge and postnasal drip with mild posterior pharyngitis.

The heart was enlarged to the anterior axillary line and pounding tones were noted. The blood pressure was 230 mm. of mercury systolic and 140 mm. diastolic. Results of laboratory analyses were normal except for eosinophilia (4 per cent) and a trace of albumin in the urine.

Analysis of the patient's diet showed it to be low in (1) vitamins A, D, and E, (2) B complex, (3) ascorbic acid and (4) calcium and phosphorus. The patient had voluntarily restricted salt intake for several years.

The diet was revised to include proper nutrients and vitamins, and the restriction on salt intake was kept in force. Three vitamin tablets,* three capsules‡ containing vitamin A with tocopherol acetates, and 300 mg. of ascorbic acid, in divided daily doses, were prescribed. Theominal was continued.

Gradual improvement followed. At the end of six months, episodes of rhinitis occurred only about once a month and were considerably milder (only one handkerchief a day was needed, as against 15 previously). The nose and throat were normal in appearance. The blood pressure was stabilized at 180 mm. of mercury systolic and 90 mm. diastolic, but the heart was still enlarged and the pounding tones still present.

SUMMARY

In one of the two cases reported, the patient had allergic sinusitis of long standing. Dietary deficiencies were discovered. Although operation finally was done, the nasal discharge had decreased greatly following ingestion of additional nutrients and vitamins in large quantity over a period of several weeks, and relapse occurred when the dosage was reduced.

In the other case, the patient had a history of hay fever of 15 years' duration. She was taking luminal and theobromine because of blood pressure of 240 mm. of mercury systolic and 150 mm. diastolic. Upon dietary analysis, deficiencies were noted and the diet was revised to include proper nutrients and vitamins. Luminal and theobromine were continued. Rhinitis was greatly relieved and the blood pressure at the end of six months was stabilized at 180 mm. systolic and 90 diastolic.

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REFERENCE

1. Selfridge, G.: Relation of nutritional deficiencies to perennial hay fever and allergic rhinitis, E.E.N. & T. Monthly, 27:313, July 1948.

*Each tablet contained: Thiamine chloride, 3 mg.; riboflavin, 5 mg.; pyridoxine, 1 mg.; pantothenic acid, 10 mg.; nicotinic acid, 10 mg.; choline, 30 mg.; inositol, 30 mg.; dry yeast powder, 240 mg.

‡Each capsule contained 50,000 units of vitamin A and 36.8 mg. of d-alpha tocopherol acetate.

Barnyard Fowl as a Source of Human Ornithosis

Case Report

H. Karrer, M.D., B. Eddie, Dr.P.H., and R. Schmid, M.D., *San Francisco*

ALTHOUGH psittacosis in man is most commonly attributed to birds of the psittacine family, many cases have resulted from contact with non-psittacine birds, particularly pigeons,[1, 4] fulmar petrels and ducks. Less than 50 per cent of the clinical infections in the United States from January 1945 to November 1947 were attributable to birds of the parrot family (Table 1). During this same period, the virus was isolated in many instances from birds other than parakeets or pigeons by Eddie (Table 2). It has been known for several years that chickens can carry a psittacosis-like virus but very few cases have been reported. Meyer and Eddie[4] described a human infection in which chickens were the probable infective source. In 1947, they encountered another case in which ornithosis was diagnosed on the basis of typical clinical symptoms and the complement-fixation test (titer: 1:16++++) and the isolation of the virus from chickens on the patient's farm. Because intensive penicillin therapy was instituted immediately after diagnosis, attempts to isolate the virus from the patient's blood and sputum were not made.

The case presented in this paper can be considered as another example of clinical ornithosis acquired from chickens. The extreme rarity of such cases justifies a detailed description.

CASE REPORT

The patient,* a 49-year-old chicken farmer, was admitted to the University of California Hospital on February 11, 1949. He had complained of fatigue and general malaise since about December 4, 1948, when herpes developed on the upper lip and nose. In spite of these mild symptoms, he continued to work until January 30, 1949. At this time he had several chills, his temperature was consistently elevated to 101°F. to 103°F. for several days and this fever was accompanied by severe cervico-occipital aching. These symptoms were relieved by aspirin. The patient had no chest pain, dyspnea or sore throat, but he did have a slightly productive cough with a little yellowish green sputum. He had lost about 30 pounds in the previous ten weeks.

On admission to the hospital on the twelfth day after the onset of chills and fever, he did not appear to be particularly ill. Physical and laboratory examination revealed the following:

The temperature was 37.9°C., pulse rate 90 beats per minute and respiratory rate 18 per minute. The blood pressure was 135 mm. of mercury systolic and 95 mm. diastolic in the supine position and 90 mm. systolic and 60 mm. diastolic in the standing position. Neurologic and cardiac examination revealed no abnormalities. Aside from fine rales over the base of the right lung heard anteriorly and posteriorly, and a slight decrease in breath sounds, pulmonary signs were not remarkable. The thoracic roentgenogram, first reported to give no evidence of disease, on review revealed a very fine homogeneous infiltration of the right lung.

The concentration of hemoglobin was 15.3 gm. per 100 cc. of blood; the hematocrit reading was 44. The leukocyte count was 10,100 per cubic millimeter of blood and the differential count was: polymorphonuclear leukocytes, 52 per cent (48 per cent filamentous, 4 per cent nonfilamentous); eosinophils,

*Case reported with permission of his physician, Dr. H. D. Brainerd, assistant clinical professor of medicine and pediatrics, University of California Medical School.

From the George Williams Hooper Foundation (Karrer and Eddie), and the University of California Hospital (Schmid).

TABLE 1.—*Psittacosis in Birds Other Than Parakeets and Pigeons January 1945 to November 1947*

Bird	Location	Virus Isolation: Tested	Virus Isolation: Positive	Remarks
Ducks	Long Island, New York	97	35	
Chickens	Oakland, California	19	4	Pigeon exposure. Virus isolated from viscera and intestines.
	New York	4	3	Pigeon exposure. Virus isolated from intestines.
	Pasadena, California	2	2	Virus isolated from viscera and intestines.
Sea gulls	East and West Coast	5	3	American herring gull.
Dove	New York	1	1	
House finch	California	1	1	Linnet (Carpodacus Mexicanus)
Totals		129	49	

2 per cent; lymphocytes, 28 per cent; monocytes, 18 per cent. Platelets were normal. The sedimentation rate was 35 mm. in one hour (Westergren), corrected 28. Cold agglutinins were not found and agglutination tests for typhoid, paratyphoid A and B, tularemia and brucellosis were negative. Routine blood cultures were also negative.

The first serum specimen was taken February 12 (13th day after onset of chills and fever). The complement-fixation reaction with psittacosis antigen was positive in dilutions of up to 1:32++++ and 1:64++. In the presence of Q fever antigen, the complement-fixation test was negative. The same blood sample was used for mouse inoculation and a psittacosis-like virus was recovered with considerable difficulty, denoting the low pathogenicity of the organism. Attempts to isolate the virus from the sputum failed. A second serum sample was taken on February 17. Complement-fixation test was positive in the presence of psittacosis antigen in dilutions up to 1:32++++ and in the presence of lymphogranuloma venereum antigen (Lygranum®) was positive in dilutions up to only 1:16++.

The course of the illness as observed in the hospital was benign. The patient was almost afebrile when he entered (temperature: 37.9°C.) and he had no complaints. He did not receive specific treatment. After two days of hospitalization he became afebrile and remained so. He was discharged on February 17 (7th day of hospitalization). It was suggested that he take epinephrine because of slight postural hypotension.

An epidemiologic survey was begun on March 18. The patient's small farm home, inhabited by the patient and his wife, was located in Castro Valley, California. At the time of the investigation he had about 500 laying hens which were kept in a closed wooden barn. The hens looked quite healthy and the owner did not complain of unusual loss or egg-production drop in the past. He had had them for about one year and new birds had not been introduced into the flock. The door of the barn was kept closed and there were no broken windows or major defects in walls or roof; therefore, it seemed impossible that wild doves or pigeons (known to be carriers of the ornithosis virus) could have entered the room. Although there was a pigeon loft in the neighborhood, the patient had never been closer than 300 feet from it, nor could he remember ever having had contact with parrots or parakeets or any other birds. The hens were kept in steel wire cages which formed long files through the whole length of the room. Accordingly, there was ample possibility of contact between birds of neighboring cages, since the wire netting had quite large openings. The chicken droppings fell down through an egg-catching wire net and accumulated on the floor: from time to time they were cleaned off. The patient did not remember having made a thorough cleaning immediately preceding the onset of illness.

TABLE 2.—*Sources of Human Psittacosis in the United States—January 1940 to November 1947*

Exposure to	Cases: 1945 - Nov. 1947: 1945	1946	Nov. 1947	Total	Total 1940-Nov. 1947
Psittacine birds	35	13	15	63	130
Pigeons	33	12	9	54	106
Other birds or several kinds of birds	8	10	7	25	40
Ducks	3		1	4	
Canaries	2	2		4	
Grouse	2			2	
Pheasant	1			1	
Chickens			2	2	
Linnet			1	1	
Pet shop		1		1	
Infected laboratory material	3	4		7	7
Unknown source	1	5	3	9	13
Totals	80	44	34	158	296

TABLE 3.—*Serologic Study of Chickens on Patient's Farm: Complement-fixation Inhibition Test*

Chicken	Titers* Serum Dilutions 1:2	1:4	1:8	1:16	1:32
1	—	—	±	+	++
2	—	—	±	+	+++
3	—	—	+	++	+++
4	—	+	++	+++	+++
5 & 6	±	±	+	+	++
7	±	+	++	+++	+++
8-10	+	++	+++	+++	+++
11	++	++	+++	+++	+++
12-15	+++	+++	+++	+++	+++
16 & 17	++±	++±	++±	++±	++±
18	++++	++±	++±	+++	+++
19	++++	++±	++±	++±	++±
20	++++	++++	++++	+++	+++

Fixation control: +++

Complement-fixation test: Negative in all instances.

*++± = between +++ and ++++

Blood samples were taken from ten white Leghorns and ten New Hampshire reds (4 per cent of the flock). These birds occupied ten cages which were apart from each other. They were considered to comprise an adequately representative group for the survey. The clotting time for the blood from ten chickens was extremely long; some samples did

not clot for as long as two or three hours. The 20 serum specimens were tested by the complement-fixation inhibition method (Karrer and co-workers). The results are recorded in Table 3. The serum of ten birds gave a positive reaction, that of one, a questionable reaction, and of nine, a negative reaction. Four of the birds with positive reactions were white Leghorns, six were New Hampshire reds.

During the second visit, on April 13, the laying charts attached to each chicken cage were inspected. Egg production of the seropositive birds did not differ strikingly from that of the seronegative ones. In fact, some of the birds with positive serum reactions were better layers than others with negative reactions.

At this time a blood sample was taken from the patient's wife. The serum fixed complement in the presence of psittacosis antigen in a serum dilution of 1:2++++; this is considered to be an insignificant nonspecific titer. Lygranum® and Q fever antigens gave no fixation. So far as the patient knew, none of his neighbors had had an illness similar to that he had had.

DISCUSSION AND CONCLUSIONS

In the presented case it was possible to isolate the virus from the patient himself, but it could not be isolated from the spleen, liver, kidneys or cloaca of two tested chickens. The patient's positive serologic findings were not conclusive since a rise in titer during hospitalization was not demonstrated; it may have occurred early in his illness before the first specimen was tested or during the constant exposure to infected chickens. This case illustrates again the desirability of having several samples so that comparisons may be made. Isolation of the virus from the blood stream conclusively proves that the patient did have an active ornithotic infection. There seems to be little doubt about the infective source. So far as could be determined, the patient had had no contact with any birds except his chickens. Positive evidence of ornithotic infection was found among ten of twenty tested birds. The ultimate origin of the infection in the flock remains obscure. The patient usually did not kill the birds, but sold them alive as soon as their egg production became unsatisfactory; therefore the danger of acquiring the infection by the direct handling of organs (especially kidneys, liver and spleen) did not exist. But exposure to feces on the floor and the daily handling of the eggs which had passed through virus-contaminated cloacas, as well as the daily exposure to dust from the chicken house, offered ample opportunities of infection. Moreover, the closed barn was likely to retain all dust material in much higher concentration than the usual half-open chicken houses. Since the virus remains viable in the dried state for many weeks it can accumulate considerably under such conditions. The patient had not, preceding the onset of illness, performed any unusual clean-up in his barn which would have increased the dry dust contaminated with fecal, virus-containing material. Neither did he have any sick birds, which in other instances have been found to be especially infective for man.[3]

The illness was mild, in contrast to that caused by infections due to exposure to sick pigeons and parakeets. This fact perhaps allows the conclusion that the infection had not been massive, although it is possible that the chicken virus is of specifically low infectiousness. The difficulty with which the virus was recovered from chicken organs by mouse passages speaks in favor of the low infectiousness of the organism in this instance, although it is quite high for chickens, and in favor of low pathogenicity. It is possible that in other instances the human host might provide better conditions and the infection might become severe, or that another strain of the same origin might be more destructive. It was fortunate that in the reported case epidemiological investigations could be carried out. Evidence to the present indicates that chickens are a rare source of clinical infections in man. The mildness and the absence of characterizing symptoms of the condition indicate that the disease could easily run its course without diagnosis. The large number of chickens in many populated areas undoubtedly creates many opportunities for contact. It seems possible that awareness of the disease might lead to epidemiologic surveys and that these in turn might reveal that the infection is not uncommon. While, as it is now known, it is not significant among acute infections, the protracted subacute form is apparently costly from the standpoint of the patient's well-being and hence is of some diagnostic importance. Should more careful diagnostic investigation reveal that the infection is prevalent and in some instances severe, the therapeutic aspect would gain importance. Early diagnosis would give the patient the benefit of effective antibiotic therapy (penicillin in high dosage, possibly aureomycin). The infection index in man is probably low, and a predisposition may be required in order to allow development of pronounced clinical manifestation of the disease. In cases in which there is suspicion of ornithosis acquired from chickens, the birds can easily be tested by the complement-fixation inhibition method, which is not much more elaborate than the complement-fixation test, and the patient by repeated complement-fixation tests.

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California MEDICINE

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For Information on Preparation of Manuscript, See Advertising Page 2

EDITORIALS

1950 Annual Session

On May 3, 1950, the California Medical Association rang down the curtain on its Annual Session, held in San Diego for the first time in ten years. Despite the difficulties attendant on holding scientific sessions in San Diego and House of Delegates meetings on Coronado Island, the meeting attracted a large registration and proceeded with dispatch, albeit with minor irritations.

Scientific sessions catered to good attendance and produced many stimulating papers. Section and general meeting arrangements brought all scientific meetings together in two adjoining buildings in famed Balboa Park, with registration and exhibit facilities in the same location. Selected papers from those meetings will appear in CALIFORNIA MEDICINE in this and coming issues.

On the business side, the House of Delegates held its meetings in Hotel del Coronado, scene of many vigorous meetings of the Association in 1940 and earlier years. The two sessions of the House were well attended and lasted into the small morning hours before final agreement came on several contested issues.

Among other items passed upon by the House of Delegates were (1) resolutions urging cooperation by hospitals in preventing corporate practice of medicine by the hospitals, (2) resolutions calling upon the officers, employees and Delegates of the Association to subscribe to an anti-Communist oath as a prerequisite to holding office, employment or a Delegate's seat, and (3) a report advocating the discontinuance of the present radio program at the close of the year, in favor of a "grass-roots" approach to the broad problem of public relations.

The resolutions on hospitals appear in the printed resolutions appearing elsewhere in this issue and are self-explanatory. They ask cooperation in curtailing certain medical practices in which some hospitals indulge as a matter of business, and are in line with earlier decisions of the Association and of the American Medical Association.

The anti-Communist declaration required of officers, employees and Delegates was adopted in the form of two amendments to the by-laws. In essence the declaration states that the physician or employee is not and has not been a member of any organization advocating the overthrow or change in the form of government of the United States by force or by unlawful means. As in other similar instances recently publicized, criticism has been leveled at this declaration on grounds that it violates personal principles, is ineffective and is the cause of harmful dissension and controversy. However, the by-law amendments were adopted by the House of Delegates and today constitute the regulations under which officers, employees and Delegates may serve in their respective capacities. All present officers and employees have subscribed to the declaration and members of the House of Delegates will be required to do so before being seated at the next meeting of the House.

Public relations for the profession at the grass-roots level was one of the most-discussed topics at the meeting. Through the Auditing Committee, the Council of the Association proposed that a down-to-earth approach be made on all matters affecting the public response to the activities of physicians in their individual practices. This new approach to the problem—new to the C.M.A. at least—follows the successful experience of several county medical societies in getting at the root of the public relations of the profession through analyzing the public relations of their individual members and taking steps to augment the favorable factors and correct the

unfavorable ones. Under the program adopted by the House of Delegates the Association will undertake to develop a program designed for the utilization of the individual members and carry this program into the county medical societies through official visits by the top officers of the Association. Further announcements on this campaign will be made as plans attain greater maturity.

All members are urged to read and study the deliberations and decisions of the House of Delegates. This body is the representative law-making body of the Association, representing the membership as a whole, and its actions are binding on members, officers, and Councilors alike. The brief time needed to review the transcript of its sessions will constitute a worthwhile investment.

C.M.A. Special Session

Plans have been made for a special session of the House of Delegates of the California Medical Association. The meeting will be held in Sacramento on December 2 and 3, 1950, together with simultaneous meetings of the Administrative Members of California Physicians' Service.

This meeting presages similar sessions to come. The proposed Constitution and By-laws of the Association, now lying on the table, contemplate the holding of two meetings annually of the House of Delegates; if these documents are adopted, the county medical society representatives may look forward to semi-annual meetings as a means of keeping the business of the Association up to date.

In years past the C.M.A. has had occasion several times to call special meetings of the House of Delegates. The last two such gatherings, in 1935 and 1945, were both called for the purpose of giving special attention to matters of health insurance, the 1945 session being directed at the proposals of Governor Earl Warren for compulsory health insurance legislation. Both meetings have attracted a full attendance and both have accomplished, in a short period of time, much more in the way of tangible results than the Delegates have been accustomed to in the annual sessions, where scientific gatherings and other events have tended to divert at least a part of the Delegates' attention.

Full details of the Special Session, along with the agenda, will be announced at a later date. Meanwhile, please mark the dates on your calendar. The business of the Association requires this meeting, and similar ones to come, and all Delegates should plan to be present and participate in the concentrated discussions which will be scheduled.

Letters to the Editor . . .

Scientists Have to Read Scientific Writing

Easy writing's curst hard reading—
SHERIDAN

Advances in science are founded on what is already known. Scientists telling other scientists what advances they have made should presume a reasonable acquaintance with what is already known. The competition for readers' attention is so sharp that any one writer's quota is mighty small. He would do well to use what readers' attention he can get for just one purpose, namely: to get his message across. He will see that it is a short-sighted policy to use up any of his readers' attention for retelling what is already known. Yet we see many an essay, the first half of which is devoted to historical background and other scientists' false starts.

We were all medical students once, when we learned that success depended on convincing professors that we knew something. We were all struggling young practitioners once, and believed (rightly) that success depended on convincing our patients and our colleagues that we had a solid scientific foundation for our art. But when we undertake to write and talk, as clinical scientists, for the eyes and ears of other clinical scientists, we should show ourselves mature enough to refrain from the exhibition of knowledge for the sake of its exhibition.

Let us therefore exhort our essayists to write sharply to the point. Let them design their structure with no waste floor space, dig to bedrock only under the rooms that carry weight, and buy no stone lions for the front stoop.

Those who write for CALIFORNIA MEDICINE can hope for 10,000 readers. Is it not simple economics to say: The essayist can well afford to spend 20 hours shortening and sharpening his presentation if his readers save a sum total of twice that time in reading it. Forty hours among 10,000 readers amounts to only 15 seconds each. Can one not by taking thought subtract a minute from the reading time?

Moreover, if the essay is short and full of graphic presentation, reader willingness will be correspondingly high. That is to say, if the thing looks half as long to read, four times as many men will read it. And after all, that's what you're after, isn't it, to get your ideas into the minds of your fellows? The figures are purely intuitional, but let every ambitious essayist submit them to his own intuition and see if he is not in at least "qualitative" agreement.

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NOTICES AND REPORTS

A.M.A. President-Elect

John W. Cline is the new President-elect of the American Medical Association. By its action on Thursday, June 29, the House of Delegates of the American Medical Association honored California and San Francisco by electing to its highest office the second Californian to be so honored. In 1923 Dr. Ray Lyman Wilbur became the first Californian to be placed at the helm of the American Medical Association. Like his distinguished and respected predecessor, Dr. Cline in his contributions to American medicine has shown himself to be eminently qualified for the high position to which he was elected.

It is most difficult to properly appraise the value of John Cline's services to California and American medicine. It is impossible to imagine what the position of American medicine would be today had we not had his leadership and counsel.

Born in Sonoma County, California, the son of a practicing physician, he attended public schools in California and received an A.B. degree at the University of California in 1921. His medical training was at Harvard University where he obtained his M.D. in 1925. Following an internship in the Faulkner Hospital, he became house officer at Massachusetts General Hospital in Boston for two years and then resident surgeon at Bellevue Hospital, New York City, in 1927-1929. Since that time he has practiced surgery in San Francisco. Dr. Cline's contributions to the surgical literature have been numerous and his professional attainments have been such as to place him in the top rank of San Francisco surgeons. He is associate clinical professor of surgery at Stanford University School of Medicine, assisting visiting surgeon at San Francisco Hospital, associate surgeon at Children's Hospital, and a member of the board of directors of St. Francis Hospital. His professional attainments have been recognized by a fellowship in the American College of Surgeons, membership in the San Francisco Surgical Society, the Pacific Coast Surgical Association, and other scientific organizations, to all of which he has contributed much of his abilities.

Early in Dr. Cline's career his capacity for leadership was given recognition in his election as student body president at the University of California. His colleagues in the field of medicine have recognized his ability in organizational work and his sound judgment by electing him to the board of directors and later to the presidency of the San Francisco County Medical Society, to membership on the Council of the California Medical Association, and to the presidency of the association during the year 1947. Those who have had the privilege of working with him in the field of organized medicine know well his organizational and executive ability. It has been during the period of his leadership that the California Medical Association has become a well-knit, militant organization able to combat all efforts to promote state medicine over the past few years.

Dr. Cline was elected a delegate from the California Medical Association to the American Medical Association in 1945. His remarkable ability is further reflected in the place of eminence which the California delegation now occupies in the House of

Delegates of the American Medical Association. While he was chairman of the California delegation the process of alerting the American Medical Association to the dangers of government compulsory medicine began. From the first early and feeble attempts to put new life into the Board of Trustees and House of Delegates, to the emergency presented by the unexpected election results of 1948, John Cline has been the moving spirit and the guiding hand which enabled the California delegation to offer to the American Medical Association a tested and effective plan to combat socialized medicine.

His appointment in 1948 as a member of the newly organized Coordinating Committee of the A.M.A. was followed promptly by establishment of the National Education Campaign of the association. On a national scale this campaign has been a most effective one in furthering voluntary health insurance, in improving the public relations of the American Medical Association, and in thwarting those who advocate socialization of medicine.

Because of his statesmanlike conduct as a member of the House of Delegates and of the Coordinating Committee of the American Medical Association he has gained the respect and admiration of these groups as well as of the Board of Trustees. His great and outstanding ability as a leader of American medicine has now been further recognized by the House of Delegates which has honored him by awarding the highest accolade in its power to bestow.

The California delegation loses its highly respected leader, but the American Medical Association has gained a leader who is preeminently fitted to guide the ship of medicine through the stormy course before it. We of California are honored by the selection of John Cline as President-elect of the American Medical Association, and that great organization is to be congratulated on garnering the finest talent of California, or any other state for that matter, for leadership of American medicine.

Council Meeting Minutes

369th Meeting

Tentative Draft: Minutes of the 369th Meeting of the Council, Hotel Del Coronado, Coronado, April 29, 1950.

The meeting was called to order by Chairman Shipman in the Palm Room of Hotel del Coronado, California, at 9:00 a.m., Saturday, April 29, 1950.

Roll Call:

Present were President Kneeshaw, President-elect Cass, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Shipman, Bailey, West, MacLean, Frees and Thompson, and Secretary-Treasurer Garland. Absent for cause: Editor Wilbur.

Present by invitation were Dr. Dwight H. Murray, legislative chairman; Dr. John W. Cline, A.M.A. Delegate; executive secretary Hunton, legal counsel Hassard, field secretary Clancy, county society executive secretaries Gillette of Fresno, Young of San Diego; Dr. R. O. Bullis, secretary of the Los Angeles County Medical Association; Mr. Brooks Crabtree, legal counsel for the San Diego County Medical Society; and Messrs. Clem Whitaker, Clem Whitaker, Jr., James Dorais and Ned Burman of public relations counsel.

1. *Minutes for Approval:*

(a) On motion duly made and seconded, minutes of the 368th meeting of the Council, held March 19, 1950, were approved.

(b) On motion duly made and seconded, minutes of the 220th meeting of the Executive Committee, held March 19, 1950, were approved.

2. *Membership:*

(a) A report of membership as of April 22, 1950, showing 9,914 dues-paid members, was received and ordered filed.

(b) On motion duly made and seconded, one member whose 1949 and 1950 dues had been paid since the last Council meeting was voted reinstatemen as an active member.

(c) On motion duly made and seconded, 1,225 members whose 1950 dues had been received since April 1, 1950, were voted reinstatement as active members.

(d) On motions duly made and seconded in each instance, six applicants were elected as Associate members. These were:

Bruno Gerstl, Alameda County.
Wenonah King Thom, Butte-Glenn County.
Walter Rohlfing, Jr., Fresno County.
Mildred Van Cleve, Riverside County.
H. D. Rose, San Joaquin County.
Helen B. Hart, Santa Barbara County.

(e) On motions duly made and seconded in each instance, two applicants were elected to Life Membership. These were:

Jesse W. Citron, Alameda County.
H. B. Osborn, Ventura County.

(f) On motions duly made and seconded in each instance, five applicants were elected to Retired Membership. These were:

Richard E. Brenneman, Calvin B. Witter, Los Angeles County.
James A. Cutting, Santa Clara County.
J. B. Blackshaw, A. A. Thurlow, Sonoma County.

(g) On motions duly made and seconded in each instance, reductions in dues were granted to 14 members because of illness or postgraduate studies.

3. *Financial:*

(a) A report of bank balances as of April 22, 1950, was received and ordered filed.

(b) The executive secretary reported that New Mexico Physicians' Service had repaid an additional $1,000 on its loan from the association and that further repayments had been promised on the basis of new sources of income developed by N.M.P.S.

(c) The executive secretary reported that $1,883.82 of the $10,000 total fund of the San Diego voluntary health insurance program had been returned as the unused balance of the fund. Of the amount returned, one-half was credited to the association and the other half to the other participating organizations.

4. *Auditing Committee:*

Chairman MacLean of the Auditing Committee read the report of the committee on its study of proposed public relations activities. The report recommended the establishment of a public relations department within the association and the discontinuance of the radio program in favor of alternate activities. On the basis of its recommendations the committee suggested that dues for 1951 be established at $36 per active member.

Dr. John W. Cline and Mr. Clem Whitaker discussed these recommendations and there was general discussion.

It was moved and seconded that the report as a whole be tabled but that the major portions of it be considered individually. The motion did not come before the Council for a vote but an informal poll showed that (1) the radio program should be continued; (2) that dues be retained at $45 and (3) that local public relations programs should be strengthened under association sponsorship. The Auditing Committee was requested to revise its report accordingly and report back to the next meeting.

5. *Legal Department:*

Mr. Hassard reported that a proposal had been made by certain hospital interests to institute court action to secure an interpretation of state laws relating to the qualifications for members of staffs of hospitals organized under the District Hospital Law. On motion duly made and seconded, it was voted that the association not sponsor or advocate such proposed litigation.

6. *Award for Journalism:*

Dr. Ray reported that the Santa Clara County Medical Society had established an annual award for journalism for stories or series of stories in newspapers generally circulated in the Santa Clara County area which were adjudged beneficial to the public in matters of health or medical care. The recipient of the first annual award had been selected and Dr. Ray asked that the agenda of the House of Delegates be amended to permit the award to be made before that body. It was regularly moved, seconded and voted to make this change in the agenda of the House of Delegates.

7. *1949 House of Delegates Resolution:*

Discussion was held on a resolution adopted by the 1949 House of Delegates on which inadvertently no action had been taken during the year. It was agreed to recommend to the 1950 House of Delegates that a committee be appointed to act during the coming year on possible administrative procedures in California Physicians' Service.

8. *San Diego County Disaster Fund:*

Dr. West asked authority for the San Diego Disaster Fund to solicit funds during the Annual Session for the benevolences administered by the organization. On motion regularly made and seconded, such authority was granted.

9. *Blood Bank Commission*

Dr. Richard O. Bullis, secretary of the Los Angeles County Medical Association, was asked about the attitude of the council of that association toward the proposed establishment of a revolving loan fund of $150,000 to be used, with matching funds, for establishing blood banks in several areas of California. He reported that, for reasons of local policy, the county association was working toward an agreement with the American National Red Cross for a cooperative working agreement which would in no way conflict with the plans of the association's Blood Bank Commission. In regard to the proposed loan fund, he expressed his belief that the trustees of the Los Angeles County Medical Association would approve the establishment of such a fund and its use in inaugurating blood banks in the outlying areas of Los Angeles County. After discussion, it was agreed to add to the Council's report to the House of Delegates the proposal that such a fund be established.

Adjournment:

At this time, 11:50 a.m., the Council adjourned until 7:30 a.m., Sunday, April 30, 1950.

* * *

370th Meeting

Tentative Draft: Minutes of the 370th Meeting of the Council, Patio Dining Room, Hotel del Coronado, Sunday, April 30, 1950.

The meeting was called to order by Chairman Shipman at 7:30 a.m., Sunday, April 30, 1950, in the Patio Dining Room, Hotel del Coronado, Coronado, California.

Roll Call:

Present were President Kneeshaw, President-elect Cass, Speaker Alesen, Vice-speaker Charnock, Councilors Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Shipman, Bailey, West, MacLean, Frees and Thompson, and Secretary-Treasurer Garland. Absent for cause: Editor Wilbur.

Present by invitation were Dr. Dwight H. Mur-

ray, legislative chairman, executive secretary Hunton; field secretary Clancy, legal counsel Hassard, county society executive secretaries Gillette of Fresno, Tobitt of Orange, Young of San Diego, Wood of San Mateo, and Donovan of Santa Clara, and Messrs. Clem Whitaker, Clem Whitaker, Jr., James Dorais and Ned Burman of public relations counsel.

1. *Industrial Accident Medical Fees:*

Announcement was made of a meeting scheduled for noon, April 30, of the Committee on Industrial Accident Fees, at which time matters relating to industrial fees would be open for discussion.

2. *Auditing Committee Report—Budget for 1950-1951:*

Dr. MacLean, chairman of the Auditing Committee, read the revised report of the committee, which recommended a public relations budget item of $150,000 for the 1950-1951 fiscal year and recommended dues for the 1951 calendar year at $40 per active member. On motion duly made and seconded, the proposed budget and dues were approved by the Council for presentation to the House of Delegates.

3. *Legal Department:*

Mr. Hassard reported on new automobile emblems being sold by a California manufacturer and pointed out that such emblems were useful only in meeting one section of the motor vehicle laws and were not intended to replace standard emblems in use by physicians, particularly the emblem issued by the American Medical Association.

4. *Executive Session:*

At this point the Council went into executive session, rising therefrom prior to consideration of the next item of business.

5. *Organization Expense:*

On motion duly made and seconded, it was voted to appropriate $10,000 as additional funds to meet organization expenses in San Diego County.

6. *Proposed New County Society Charter:*

Dr. Lum reported that the Contra Costa County Medical Society wished to combine with the Alameda County Medical Association to form the Alameda-Contra Costa County Medical Association. This move has been approved by the councils of both county societies and by the membership of the Contra Costa Society by a vote of 90 to 14. The membership of the Alameda County Medical Association will be asked to approve the merger as a prerequisite to the issuance of a new charter.

On motion duly made and seconded, it was voted that the Council recommend to the House of Delegates that a new charter for the combined societies be issued, provided the membership of the Alameda County Medical Association approves the merger and provided the charters of the two existing societies are surrendered to the Secretary of the C.M.A. for cancellation not later than November 1, 1950.

7. *Public Policy and Legislation:*

Dr. Murray discussed several items of legislation now before Congress and urged that all physicians take an active interest in the June primary elections. On motion duly made and seconded, it was unanimously voted to send a resolution of sympathy and best wishes to Mr. Ben Read, executive secretary of the Public Health League of California, currently recovering from surgery.

8. *Membership of Industrial Accident Fee Committee:*

A letter from an anesthesiologist, asking that a representative of that specialty be named to the Committee on Industrial Accident Fees, was read and discussed. On motion duly made and seconded, it was voted to maintain the present composition of this committee.

9. *Meeting Place for 1951:*

Discussion was held as to a meeting place for 1951 and invitations from Los Angeles, San Francisco, Long Beach and San Diego were presented. It was agreed to discuss this matter further at the meeting of May 1, 1950.

Adjournment:

At this point, the meeting was adjourned, to meet again at 7:30 a.m., Monday, May 1, 1950.

' ' '

371st Meeting

Tentative Draft: Minutes of the 371st Meeting of the Council, Hotel del Coronado, Coronado, Monday, May 1, 1950.

The meeting was called to order by Chairman Shipman at 7:30 a.m., Monday, May 1, 1950, in the Patio Dining Room of the Hotel del Coronado, Coronado, California.

Roll Call:

Present were President Kneeshaw, President-elect Cass, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Anderson, Ray, Montgomery, Lum, Pollock, Green, Shipman, Bailey, West, MacLean, Frees and Thompson, and Secretary-Treasurer Garland. Absent for cause: Editor Wilbur.

Present by invitation were Dr. Dwight H. Murray, legislative chairman; Dr. Wilton L. Halverson, State Director of Public Health; Dr. John W. Cline, A.M.A. Delegate; executive secretary Hunton, field secretary Clancy, legal counsel Hassard, county society executive secretaries Gillette of Fresno, Venables of Kern, Tobitt of Orange, Young of San Diego, Kihm of San Francisco, Wood of San Mateo and Donovan of Santa Clara; Messrs. Clem Whitaker, Clem Whitaker, Jr., James Dorais and Ned Burman of public relations counsel, and Drs. Frank A. MacDonald, Leopold Fraser, Elizabeth Mason-Hohl, Ralph B. Eusden, E. Vincent Askey, C. Kelly Canelo, Robertson Ward, L. Duke Mahannah, Eugene F. Hoffman and Frederic Ewens, all delegates or alternates to the American Medical Association.

1. *State Department of Public Health:*

Dr. Wilton L. Halverson, State Director of Public Health, reported that an advisory committee to his department's division of crippled children's services had been appointed and that this committee included Dr. Hartzell Ray as a representative of the Council. He also reported that a Committee on Morbidity Survey had met and urged that a careful study be made before any survey of morbidity be undertaken.

In response to a question by Dr. Robertson Ward, C.M.A. Delegate to the A.M.A. and chairman of the A.M.A. House of Delegates' Committee on Chronic Diseases, Dr. Halverson stated that he would forward to the Council the approximate cost of a survey of venereal disease which was undertaken in San Francisco in the last three months of 1949, such information to be directed to Dr. Ward.

2. *Los Angeles County Physicians' Aid Association:*

Dr. Elizabeth Mason-Hohl outlined for the Council the organization of the Los Angeles County Physicians' Aid Association, with which the association's Benevolence Committee has been cooperating for several years. She reported that the organization now owns 60 acres of land in the San Fernando Valley and another 35 acres in a desert location, on which it is proposed to build homes for the care of needy physicians or their families under a permanent benevolence program. She asked the continued cooperation of the association in this project.

3. *Legal Department:*

Mr. Hassard introduced to the Council Messrs. Brooks Crabtree and Gerald Driscoll, legal counsel for the San Diego County Medical Society.

4. *A.M.A. Delegates:*

Dr. E. Vincent Askey, chairman of the California delegation to the A.M.A., solicited instructions or suggestions for the delegation for the June 1950 A.M.A. meeting.

5. *Los Angeles Resolution on Fees:*

Dr. Ben Frees presented a resolution which was adopted by the Council of the Los Angeles County Medical Association earlier this year, relative to a clear understanding between physicians and patients as to fees to be charged. (This resolution is attached hereto and made a part of these minutes.)

On motion duly made and seconded, it was voted that the Council make arrangements for publicizing this resolution.

Adjournment:

At this point, 8:45 a.m., the Council adjourned, to meet again at 7:30 a.m., Tuesday, May 2, 1950.

* * *

Addendum to Minute No. 5, 371st meeting of the Council, May 1, 1950:

RESOLUTION

WHEREAS, The number of written complaints against members reaching the office of the association has increased during the past year to alarming proportions, therefore constituting a most serious problem in public relations; and

WHEREAS, The handling of these complaints in an attempt to be fair to both complainant and member involved has become a task beyond the ability of committees to handle in fairness to all parties involved; and

WHEREAS, Approximately 85 per cent of the complaints, both regarding fees and professional conduct, indicate a lack of understanding on the part of the patient as to what fees might be expected or as to the services rendered by the doctor; and

WHEREAS, A most important step in grass roots public relations is to eliminate as much as possible complaints of all kinds against members; therefore, be it

Resolved: By the Council of the Los Angeles County Medical Association that all members be requested, before service is rendered to a patient, to inform that patient as accurately as possible, the cost of such service, whether it be medical care or surgery, and to inform the patient of fees other than the physician's fees (assistant surgeon, anesthetist, laboratory, hospital, etc.) to avoid any possible complaint relative to fees charged; and be it further

Resolved: That it be the sense of this Council that in a complaint against a doctor relating to fees, in which the doctor has not informed the patient of the fee involved for the service, that such doctor will appear in an unfavorable light when such complaint is studied by the committee handling such complaint; and be it further

Resolved: That a copy of this resolution be mailed to every member of the association; and be it further

Resolved: That steps be taken at once through widespread publicity and advertising, to inform the public that matters of fees for medical service should be arranged with the doctor before services are rendered.

* * *

372nd Meeting

Tentative Draft: Minutes of the 372nd Meeting of the Council, Hotel del Coronado, Coronado, Tuesday, May 2, 1950.

The meeting was called to order by Chairman Shipman at 7:30 a.m., Tuesday, May 2, 1950, in the Patio Dining Room of Hotel del Coronado, Coronado, California.

Roll Call:

On roll call, all officers and Councilors and Secretary-Treasurer Garland were present. Absent for cause: Editor Wilbur.

Present by invitation were Dr. Dwight H. Murray, legislative chairman; legal counsel Hassard, field secretary Clancy, county society executive secretaries Waterson of Alameda, Gillette of Fresno, Wood of San Mateo and Young of San Diego; Ned Burman of public relations counsel; and Hon. Sam

L. Collins, Speaker of the Assembly of the California State Legislature.

1. *Public Policy and Legislation:*

The Chairman presented Hon. Sam L. Collins, Speaker of the Assembly of the California State Legislature, who spoke on the importance of every physician working for a full vote at the coming elections. Mr. Collins also urged consideration of the importance of the coming reapportionment of California's Congressional districts.

2. *Hospital Facilities:*

Discussion was held on the situation in one local community where the only hospital is owned and operated by an osteopathic physician and surgeon. President Kneeshaw emphasized his belief that while the ethical considerations were primarily for county society decision, an over-all association policy would constitute guidance which would be desirable in the interests of harmony and uniformity throughout the state. It was agreed to refer this matter to a special committee consisting of Drs. Pollock, Askey and Montgomery, with a request that the committee evolve a statement of policy which could be a state level guide to the component county societies.

3. *Thanks to Committees, Woman's Auxiliary, etc.:*

It was regularly moved, seconded and voted that the Council extend a special vote of thanks to all committees for their work during the preceding year, to all committees connected with the annual session of the association, to the Woman's Auxiliary and to affiliated groups.

4. *Review of Procedures in C.M.A. Office:*

It was regularly moved, seconded and voted that the Auditing Committee should request the new auditor to prepare an analysis of business methods and procedures in the association office and to offer suggestions for improvement in same, where and if necessary.

5. *Meeting Place for 1951:*

On motion duly made and seconded, it was voted to hold the 1951 Annual Session at the Biltmore Hotel, Los Angeles, at dates to be determined.

Adjournment:

At this point the Council adjourned, to meet again at 7:30 a.m., Wednesday, May 3, 1950.

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373rd Meeting

Tentative Draft: Minutes of the 373rd Meeting of the Council, Hotel del Coronado, Coronado, Wednesday, May 3, 1950.

The meeting was called to order by Chairman Shipman at 7:30 a.m., Wednesday, May 3, 1950, in the Patio Dining Room of Hotel del Coronado, Coronado, California.

Roll Call:

Present were President Cass, President-elect MacLean, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Henderson, Dau, Ray, Montgomery, Lum, Pollock, Green, Shipman, Bailey, West, Heron, Frees and Thompson, and Secretary-Treasurer Garland. Absent for cause: Editor Wilbur.

Present by invitation were Dr. Dwight H. Murray, legislative chairman; executive secretary Hunton, legal counsel Hassard, field secretary Clancy, county society executive secretaries Wood of San Mateo, Waterson of Alameda, Tobitt of Orange, Kihm of San Francisco, Donovan of Santa Clara; Messrs. Clem Whitaker, Jr., and Ned Burman of public relations counsel.

1. *Organization of Council*

Dr. Shipman acted as chairman, pending election of a chairman, and introduced Councilors Neil Dau of Fresno (succeeding Axcel E. Anderson) and Ivan C. Heron of San Francisco (suceeding H. Gordon MacLean) to the Council.

Nominations were called for Chairman of the Council and on nominations duly made and seconded, Sidney J. Shipman was unanimously elected chairman.

On motion duly made and seconded, Donald D. Lum was unanimously elected Vice-Chairman of the Council.

On motion duly made and seconded, Dwight L. Wilbur was unanimously appointed Editor.

On nomination duly made and seconded, L. Henry Garland was unanimously appointed Secretary-Treasurer.

2. *Naming of Auditing Committee:*

The chairman, with the consent of the Council, appointed Drs. Donald D. Lum (chairman), M. Laurence Montgomery and Ivan C. Heron as members of the Auditing Committee.

3. *Felicitations to Florida State Medical Association:*

It was regularly moved, seconded and voted that the Council send its congratulations to the Florida State Medical Association on the occasion of its successful campaign to elect a United States Senator whose views on health matters were in the interest of improved public health and better standards of medical care.

4. *Committee on Industrial Accident Fees:*

It was regular moved, seconded and voted to request Dr. E. Vincent Askey, chairman of the Committee on Industrial Accident Fees, to furnish the Council with quarterly progress reports which the Councilors might discuss with their respective county medical societies.

5. *Committee on Public Health and Public Agencies:*

Drs. Alesen (chairman), Thompson and West discussed several phases of the activities of the Committee on Public Health and Public Agencies.

Dr. Alesen reported on a meeting with officials of the Bureau of Vocational Rehabilitation of the State of California Department of Education, at which the procedures of the bureau had been reviewed. His committee has suggested to the bureau that an appraisal test of three questions on medical services be asked of all agencies referring applicants to the bureau. These questions would, in effect, be:

1. Is the (medical) service rendered one which the patient can reasonably secure elsewhere?

2. Is the individual required to make some effort to secure these services for himself?

3. Is a charge made for the services and, if so, is the charge in proportion to the service rendered?

Dr. Alesen expressed the belief that the application of such questions would eliminate in great part the criticism levelled at the bureau for providing physical examinations in advance of using a means test to determine eligibility of a candidate for medical services under the rehabilitation program.

Dr. Thompson reported on his attendance at a meeting of the hospital advisory committee of the State Department of Health and stated that efforts are being made in all parts of the state to qualify hospitals to receive state or federal funds now available for hospital construction. He urged that careful attention be paid to this statewide movement.

Dr. West reported that he had met on April 27 with a committee to consider a morbidity survey, the committee representing medical, hospital and other interests, and that the committee had discussed the questions of whether or not such a survey could be made and, if so, whether or not it could be effective.

Dr. West also stated that in his opinion it was still too early to make recommendations on the advisability of physicians accepting fees for services rendered in cases of poliomyelitis where the patient was receiving his care at the expense of a foundation and where no means test was applied in the selection of patients.

6. *Committee on Scientific Work:*

Dr. Garland, chairman of the Committee on Scientific Work, asked the approval of the Council on the suggestion that future annual sessions place more emphasis on large general scientific meetings and encourage a limitation of two meetings on the existing scientific sections. The Council approved this suggestion.

7. *Hospital Facilities:*

Dr. Pollock, chairman of the Council's committee on a local hospital situation, reported that the San Bernardino County Medical Society would review the situation in the light of present circumstances. (See Item 2, minutes of 372nd meeting.)

8. *House of Delegates Resolutions:*

(a) Resolution No. 8 of the 1950 House of Delegates, referring to approval of indemnification insurance, was discussed and it was regularly moved, seconded and voted that this item be referred to the Committee on Medical Economics and the author be so notified.

(b) Resolution No. 16, referring to journal subscriptions for medical students, was, on motion duly made and seconded, deferred for further consideration until after the 1950 session of the American Medical Association (at which similar resolutions are due for presentation).

(c) It was regularly moved, seconded and voted that the chairman of the Council confer with the President of the Board of Trustees of California Physicians' Service relative to Resolution No. 10, dealing with a proposed combination of fee schedule committees.

(d) On motion duly made and seconded, it was voted to refer to the Committee on Associated Societies and Technical Groups for study, Resolution No. 19, referring to the practice of psychology.

9. *Time and Place of Next Meeting:*

It was agreed to hold the next meeting of the Council in San Francisco on a date to be selected by the chairman.

Adjournment:

There being no further business, the Council adjourned at 9:50 a.m.

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374th Meeting

Tentative Draft: Minutes of the 374th Meeting of the Council, San Francisco, May 27, 1950.

The meeting was called to order by Chairman Shipman in Room 220 of the St. Francis Hotel, San Francisco, on Saturday, May 27, 1950, at 9:30 a.m.

Roll Call:

Present were President Cass, President-elect MacLean, Speaker Alesen, Secretary-Treasurer Garland, Editor Wilbur and Councilors Ball, Crane, Dau, Ray, Lum, Pollock, Green, Shipman, Bailey, West, Heron, Frees and Thompson.

Absent for cause: Vice-Speaker Charnock, Councilors Henderson and Montgomery.

A quorum present and acting.

Present by invitation were: Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Field Secretary Clancy, Legal Counsel Howard Hassard; county society executive secretaries Kihm of San Francisco, Tobitt of Orange, Wood of San Mateo, and Young of San Diego; Messrs. Clem Whitaker, Jr., James Dorais and Ned Burman of public relations counsel; Dr. C. A. Broaddus, director of postgraduate activities; Dr. Robertson Ward, representing California Physicians' Service, and Dr. John R. Upton, chairman of the Blood Bank Commission.

1. *Minutes for Approval:*

(a) On motion regularly made and seconded, minutes of the 369th Council meeting, held April 29, 1950, were approved.

(b) On motion regularly made and seconded, minutes of the 370th Council meeting, held April 30, 1950, were approved.

(c) On motion regularly made and seconded, minutes of the 371st Council meeting, held May 1, 1950, were approved.

(d) On motion regularly made and seconded, minutes of the 372nd Council meeting, held May 2, 1950, were approved.

(e) On motion regularly made and seconded, minutes of the 373rd Council meeting, held May 3, 1950, were approved.

(f) On motion regularly made and seconded, minutes of the 221st Executive Committee meeting, held May 3, 1950, were approved.

2. *Membership:*

(a) A report of membership as of May 26, 1950, was received and ordered filed.

(b) On motion duly made and seconded, Dr. Charles H. Bulson was elected to Life Membership.

(c) On motion duly made and seconded in each instance, five applicants were elected to Associate Membership. These were: Wilbur Wood Westfall, Alameda County; Lee N. Clark, Fresno County; Clarice Haylett, Marin County; Herbert Bauer, Sacramento County; Esther L. Maurer, San Diego County.

(d) On motion duly made and seconded in each instance, five applicants were elected to Retired Membership. These were: Alameda County, George Willis Clarke, Ode Taswell Leftwich, and William B. MacCracken; David M. Ghrist, Los Angeles County; Dixi McLean Bingaman, Monterey County.

(e) On motion duly made and seconded, reductions of dues were granted to two applicants who are undergoing postgraduate training.

3. *Financial:*

(a) A report of bank balances as of May 26, 1950, was received and ordered filed.

(b) The Executive Secretary recommended that certain bank accounts be consolidated with other accounts as a means of eliminating unnecessary accounting procedures. On motion duly made and seconded, it was voted to recommend this procedure to the independent auditors.

4. *Advisory Planning Committee:*

Mr. Hunton reported that the Advisory Planning Committee had met the previous day and had elected him as chairman, Mr. Waterson of Alameda County as vice-chairman and Mr. Clancy as secretary. He reported the consensus of the committee on House of Delegates Resolutions Nos. 2 and 7: On No. 2 the committee recommended that the existing negotiating committee on industrial accident matters be given the responsibility of the resolution, and on No. 7 it recommended that the county society executive secretaries be used as the starting point to gather information on existing prepayment plans.

On recommendation of the committee, Messrs. Robert Wood, executive secretary of the San Mateo County Medical Society, and William P. Wheeler of the C.M.A. staff were elected to the committee by the Council.

The committee recommended that the Council give serious consideration to the holding of a two-day interim sessions of the House of Delegates in the fall of the year.

The committee recommended that comment be deferred until further study is possible on the proposal of another state medical association for a health program on a national scale.

5. *House of Delegates Resolutions:*

(a) Resolution No. 2 of the 1950 House of Delegates was discussed and it was regularly moved, seconded and voted to refer this matter to the Committee on Industrial Accident Fees.

(b) On motion duly made and seconded, it was voted to request the executive secretaries of the county medical societies to refer to the office all material they could assemble on organizations writing prepayment medical care contracts in their respective areas.

6. *Executive Session:*

At this point the Council went into executive session, rising therefrom before proceeding to the next item of business.

7. *American Public Health Association:*

On motion duly made and seconded, it was voted to authorize Dr. Louis Regan to represent the Association at the annual meeting of the American Public Health Association and to make suggestions for the arrangement of some of the contemplated programs of the meeting.

8. *Public Policy and Legislation:*

Mr. Clancy discussed the primary elections and urged that all members cast their ballots.

9. *Committee on Postgraduate Activities:*

Dr. Charles A. Broaddus, director of postgraduate activities, requested clarification of his authority, particularly in regard to using a symbol and a label on his correspondence, attending a national conference on postgraduate programs and coordinating the postgraduate program with the programs of other organizations.

On motions duly made and seconded, it was voted to permit the director of postgraduate activities to use a printed symbol for his correspondence, to use the standard letterhead for the committee's work, and to coordinate his activities with those of the Cancer Commission and other organizations which take training programs to the rural areas.

The Council disapproved the director's presence at the national conference and the suggestion of having commercial exhibits at the two-day postgraduate institutes being planned.

A proposal of the American Legion for a pediatric program was ordered referred to the Committee on Postgraduate Activities.

10. *California Physicians' Service:*

Dr. Robertson Ward, a Trustee of C.P.S., reported to the Council on the actions of the Board of Trustees on decisions taken by the Administrative Members at the 1950 Annual Session. Dr. Donald Cass, also a C.P.S. Trustee, reported that notice of intention to discontinue the present joint operations of C.P.S. and Hospital Service of Southern California as of December 1, 1950, had been given by Hospital Service of Southern California.

Discussion was held on the request of C.P.S. Trustees for an expression of opinion on the advisability of recognizing the services of chiropodists where such services were sought on the referral by a physician member of C.P.S. On motion duly made and seconded, it was voted to request the C.P.S. Board of Trustees to withhold such recognition.

On motion duly made and seconded, Dr. Russell G. Frey of Red Bluff was nominated as chairman of the C.P.S. Fee Schedule Committee and Dr. Fred Veitch of Riverside was nominated to membership on the committee, to succeed Dr. Harold M. F. Behneman, resigned.

11. *Blood Bank Commission:*

Dr. John R. Upton, chairman of the Blood Bank Commission, reported that seven blood banks of the community type are now in operation in California and that the Tri-County Blood Bank, located in Santa Barbara to serve Santa Barbara, San Luis Obispo and Ventura counties, will open in June.

Dr. Upton recommended that $12,000 of the revolving loan fund be earmarked for San Diego, to be made available as soon as needed when and if the San Diego County Medical Society takes over the proprietorship of the blood bank now operating in San Diego as a joint venture of the City and County of San Diego, the Red Cross, the U. S. Navy and the county medical society. The Council of the San Diego County Medical Society has voted to take over this blood bank if certain conditions can be met.

On motion duly made and seconded, it was voted to establish in accordance with the action of the House of Delegates, a blood bank loan fund of $150,000, funds from which would be loaned for the establishment of community type blood banks under conditions to be drawn up by legal counsel in cooperation with the Blood Bank Commission and approved by the Executive Committee.

On motion duly made and seconded, it was voted to empower the Executive Committee to authorize a special loan of as much as $12,000 to the San Diego County Medical Society for establishment of a community type blood bank.

12. *Legal Department:*

Mr. Hassard reported on various legislative matters which appear in prospect for the 1951 legislative session. He also reported on a recent U. S. Supreme Court decision which held that a schedule of real estate commissions adopted by a local real estate board was a restraint of trade: this decision is the first to hold that standard fees for personal services may be held in restraint of trade.

Discussion was held on the proposals of some organizations to request physicians to recognize as maximums a set of fees for various surgical procedures. On motion duly made and seconded, it was voted that the Association advise county medical societies not to participate in plans to abide by fee schedules devised by two or more competitive health insurers and that any tentative steps taken by their members in such matter be held in abeyance. It was agreed that a summary of the Supreme Court decision be made a part of this communication.

On motion duly made and seconded, it was voted to appropriate $5,000 for the work of the committee on other professions, Dr. H. Gordon MacLean, chairman.

13. *Public Relations:*

Mr. Clem Whitaker, Jr., reported that his office had been working with the committee on medical students, interns and residents and that a new format had been chosen for the committee's publication *Future* so that the title would hereafter appear as *Future M.D.*

Mr. Whitaker requested approval of announcement to be made on the Association's radio program, relative to fees and the costs of medical and hospital care, and approval was granted.

Mr. Burman of Whitaker & Baxter reported that the drive to secure resolutions in opposition to compulsory health insurance was going well. He also reported that the radio program "California Caravan" was enjoying a new high listener rating.

14. *California State Board of Nurse Examiners:*

On motion duly made and seconded, it was voted to nominate Doctors R. Stanley Kneeshaw and Frank A. MacDonald for appointment to the advisory committee of the California State Board of Nurse Examiners.

15. *National Society for Medical Research:*

On motion duly made and seconded, it was voted to refer to the Executive Committee the request of the National Society for Medical Research for a contribution toward its work, with power to act.

On motion duly made and seconded, it was voted to empower the Executive Committee to investigate the needs in Los Angeles County for research and teaching animals and to appropriate up to $10,000 if the need for antivivisection counter-campaign funds is deemed imperative.

16. *Request of New Jersey Delegates to A.M.A.:*

Discussion was held on the request of the Medical Society of New Jersey for cosponsorship in the A.M.A. House of Delegates of a proposed national health plan. On motion duly made and seconded, it was voted to withhold comment on this proposal and to forward it to the California delegates to the A.M.A.

17. *Request for County Medical Society Charter:*

The Council considered a request that a new county medical society charter be recommended by the Council to the House of Delegates for Trinity County. On motion duly made and seconded, it was voted to deny this request on grounds of impracticability.

18. *Committee on Scientific Work:*

Dr. L. Henry Garland, chairman of the Committee on Scientific Work, presented a proposed schedule for the 1951 Annual Session, which would call for meetings of the House of Delegates at 1 p.m. on the first and third days of the meeting. On motion duly made and seconded, it was voted to adopt the proposed schedule.

19. *House of Delegates:*

On motion duly made and seconded, it was voted to call a special meeting of the House of Delegates, to be held December 16 and 17, 1950, in a place to be determined by the Executive Committee. The specific purposes of the special meeting are to be designated at the next meeting of the Council.

20. *Past Presidents of Association:*

Discussion was held on a proposal that past presidents of the Association be invited to attend meetings of the Council. On motion duly made and seconded, it was voted not to approve this suggestion. It was pointed out that a provision of the proposed Constitution now pending before the House of Delegates would grant the privileges of the floor of the House of Delegates to past presidents of the Association.

21. *Committee on Industrial Accident Fees:*

The chairman reported the resignation of Dr. E. Vincent Askey as chairman of the Committee on Industrial Accident Fees and it was regularly moved, seconded and voted that Dr. Francis J. Cox of San Francisco be named as chairman. It was also voted that Dr. Russell G. Frey of Red Bluff, chairman of the C.P.S. Fee Schedule Committee, be named an ex-officio member of this committee, in order to correlate the work of the two committees.

22. *Committee on Grievances:*

On motion duly made and seconded, it was voted to appoint Dr. Hans Hartman of Modesto as a member of the Grievance Committee.

23. *Committee on Advertising:*

On motion duly made and seconded, it was voted to accept the resignation, with regret, of Dr. John W. Cline as a member and chairman of the Committee on Advertising and to appoint Dr. Walter Beckh as a chairman and Dr. Robertson Ward as a member of this committee.

24. *Resolution on World Government:*

A proposed resolution on world government was presented and considered. On resolution duly made and seconded, it was voted to forward copies of this resolution to all members of the Council for their consideration at the next meeting.

25. *Agricultural Workers:*

On motion duly made and seconded, it was voted to request the State Director of Public Health to urge the Governor to appoint one or more physicians to the Governor's Committee to Survey the Agricultural Labor Resources of the San Joaquin Valley, in order that proper consideration might be assured for the medical aspects of the problem.

26. *Medical Society of the State of California:*

On motion duly made and seconded, it was voted to send a letter to the members of the Association, pointing out that the Medical Society of the State of California is not a part of the California Medical Association.

27. *Executive Session:*

At this point the Council went into executive session, rising therefrom before considering the next item.

28. *Qualification of Officers and Employees:*

The chairman stated that all officers and employees of the Association, with one exception, had qualified for office or employment under Section 9 of Chapter 6 of the by-laws, by subscribing to the oath or affirmation required therein. The chairman further stated that Dr. Garland, appointed by the Council at its organization meeting on May 3, 1950, to the office of Secretary-Treasurer, had declined to comply with the provisions of Section 9 of Chapter 6 of the by-laws. Dr. Garland presented to the Council a written statement of his reasons for declining, and requested that his statement be inserted in full in the minutes. On motion duly seconded and carried, Dr. Garland's request was granted, and his statement appears as Appendix A to these minutes. The Council also agreed to the publication of such remarks as the Editor might wish to make relative to Chapter 6, Section 9, of the by-laws. These remarks appear as Appendix B to these minutes.

The chairman then stated that due to Dr. Garland's failure to qualify for the office of Secretary-Treasurer, said office is vacant, pursuant to ruling of the legal counsel that the provisions of Section 9 of Chapter 6 of the by-laws are mandatory.

It was regularly moved, seconded and voted that a special vote of thanks be offered by the Council on behalf of all the membership to both the Secretary-Treasurer and the Editor for their four years of arduous work on behalf of the Association.

The Executive Committee was directed to select a nominee for the office of Secretary-Treasurer and report back to the Council at the earliest practicable date. The Executive Committee was also authorized to appoint a member of the Council as Assistant Secretary-Treasurer, to serve as Secretary-

Treasurer pro tem until the appointment and qualification of a permanent Secretary-Treasurer.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 5:50 p.m.

SIDNEY J. SHIPMAN, M.D.
Chairman

* * *

Appendix "A"—Minutes of the 274th meeting of the Council—May 27, 1950.

Mr. Chairman and Members:

It is evident that you believe it is your duty to insist I take the "oath of office" recently voted at the Annual Session. May I be permitted to make the following observations?

The purposes of the C.M.A. as described in the constitution are "To promote the science and art of medicine, the protection of public health, and the betterment of the medical profession; to promote similar interests of its component county societies and to unite with similar organizations in the other states and territories of the U. S. to form the A.M.A." Active membership requires that the person shall hold the degree of "doctor of medicine issued by an institution of learning, accredited at the time of conferring such degree by the A.M.A. or the Association of American Medical Colleges."

The association is therefore essentially a group of professional persons devoted to improving the quality of public health and raising standards of the medical profession. It is non-sectarian, non-political and non-compulsory.

* * *

The following is the wording of the oath of office as adopted by the House:

"All officers and employees of the Association, upon election or appointment, shall subscribe to an oath or affirmation as follows: 'I do not belong and have not belonged to any organization advocating the overthrow or change of the form of government of the U.S.A. by violent or unlawful means.' If, after full hearing, the Council shall find that an officer or employee falsely subscribed to the oath of affirmation, it may in its discretion remove the officer or employee from his office or position and fill the vacancy so created."

* * *

My comments are nine:

1. The oath is designed to keep Communists out of our organization. Will it? Lenin wrote that "morality is entirely subordinate to the interests of the class war." When it will serve the Red cause, mendacity is not only permissible, it is a duty! The case histories of Alger Hiss, Whittaker Chambers and others suggest they would have been the first to subscribe to such a loyalty pledge.

2. The oath is essentially a *political test.* It sets a grave precedent. Will we be asked next year to swear we do not belong and never have belonged to the Republican Party? Please remember, the Communist Party is still a legal political party in this country. Can we fight its ideas with affidavits?

3. The C.M.A. is a professional organization, non-political and non-compulsory. Indeed, two of its main planks are freedom of choice of physician and freedom of choice of voluntary health plan. It is against politically controlled, compulsory medical schemes. Yet it now proposes to enforce a politically designed, compulsory loyalty oath. Is this not an undignified paradox?

4. The oath is a sister effort of the new House of Delegates oath, which goes far beyond any question of loyalty: This "delegates' oath" involves past or present membership in *any organization merely held to be subversive by a U. S. Department of Justice* . . . not found or proven, mind you, but merely *held* by some person in Washington so to be. There are many distinguished physicians in the C.M.A. who have given donations to such organizations as Chinese War Relief, Spanish Wounded Veterans, Polish War Relief, etc. They are often listed as benefactors of humanitarian or welfare causes, both with and without permission. These organizations change directorship, and directions, from decade to decade. The web is indeed broad, and potential victims numerous.

5. The oath discriminates against those members who desire to work for their profession as employees or officers, but who also wish to maintain their constitutional freedoms—freedom of opinion and association.

6. It may be asked, will our patients also be required to take an oath? Remember the history of the Nazi oath—starting with loyalty to Germany and ending with an oath to Hitler. And Hitler too was an anti-Communist when it suited his purpose!

7. The oath of loyalty is or was most common in those countries where freedom is least: Witness Nazi Germany, Fascist Italy and Stalinist Russia. State or national medical organizations (to paraphrase President Conant) "are neither government bureaus nor private corporations. The criteria for joining a community (of professional persons) are not to be confused with the requirements of a Federal bureau."

8. The oath is degrading to the dignity of a profession which holds the public weal in greater esteem than does perhaps any other. Oaths do not fight the Kremlin; deeds, professional, scientific and organizational, do. The quality of our medical care in the U. S., our ability to mobilize for peace as well as for war is what counts. Let us not distract ourselves with undignified declarations; let us pursue deeds and tangible achievements.

9. Let us dismiss our officers, employees and delegates for true cause—incompetence, dishonesty, neglect of duty, physical or mental incapacity, conviction of moral turpitude—but not for upholding the Constitution of the United States!

* * *

In summary, it seems to me that the oath is foreign to the professional purposes of the C.M.A.,

is of unproven value in accomplishing its aims, and negates the basis of American democracy—the ability to win against all other concepts in a free society. It looks like the beginning of political regimentation in the C.M.A. May I respectfully urge its suspension as of this date, and the introduction of a Council resolution for its repeal at the 1951 Session? Suspension might be extralegal—but so are many acts of statesmen in time of war, whether "cold" or otherwise.

* * *

Finally, may I state that I personally do not belong and have not belonged to any organization advocating unlawful overthrow or change of our government, nor do I believe in the philosophy of Communism or Stalinism. I am for freedom and the democratic type of government. If the Council insists on this oath, I must in effect and with the deepest regret tender my resignation. If this is necessary, I must again thank the Council for the honor and privilege of serving the Association, a service which I have attempted to fulfill with the same diligence and sincerity as that with which I served the U.S.N.R. for some 15 years, including over three on active duty in World War II. This plea to reason, tolerance and justice is spoken on behalf of all the members of our Association.

L. H. Garland, M.D.

* * *

Appendix "B"—Minutes of the 274th meeting of the Council—May 27, 1950.

Mr. Chairman and Members of the Council:

I have not taken the oath recently prescribed by the House of Delegates and wish to make the following statement.

Four years ago John Cline asked me if I would be willing to assume the duties of Editor of the then official journal, *California and Western Medicine.* I accepted because, while it involved a good deal of work, I felt the journal could be considerably improved to the benefit of the C.M.A., that as a member of the organization I was under obligation to do my part to further its work and most important, because it was my understanding that no unreasonable restrictions were placed on my conduct of the journal's affairs.

The most recent House of Delegates has placed a restriction on the Editor as an officer of the C.M.A., and it is, therefore, my personal duty to give careful consideration to the limitation which has been placed upon me. The resolution, No. 18, adding section 9 to Chapter VI of the by-laws of the association, requires that an oath or affirmation be subscribed to as follows: "Section 9—Oath of Office —All officers and employees of the Association, upon election or appointment, shall subscribe to an oath or affirmation as follows: 'I do not belong and have not belonged to any organization advocating the overthrow or change of the form of government of the U. S. A. by violent or unlawful means nor do I believe in changing the form of government of the U. S. A. by violent or unlawful means.' If, after full hearing, the Council shall find that an officer or employee falsely subscribed to the oath or affirmation, it may in its discretion remove the officer or employee from his office or position and fill the vacancy so created."

The obvious purpose of this oath is to prevent Communists from holding office in the C.M.A. I have no quarrel with the intent of the resolution and by-law for I have no more desire than does anyone else to be associated with or dominated by Communists. My own experience and that of others leads me to believe that such political oaths are entirely out of place in a non-political scientific organization and, therefore, wrong in principle. Furthermore, they are ineffective in operation and cause much unnecessary dissension and strife—which is exactly what Communists want. It plays directly into their hands.

Not only is such an oath wrong in principle in a non-political, non-sectarian and non-compulsory organization, but furthermore it carries the implication that for a loyal American an oath of allegiance to the United States and to its Constitution is not enough. Something more must be sworn to—that one is not a member of certain organizations and that for members of the House of Delegates one ". . . is not and has not been at any time a member of any organization listed, published or held to be subversive by the Department of Justice . . ."

These are steps towards limitation of freedom, imagination and initiative. It is not too much to suggest that such oaths may lead to other oaths which currently seem harmless, that one is not a Socialist, a Methodist, or a Republican. As John T. Flynn has so well pointed out in his book, "The Road Ahead," a small group of Socialists in England in 1883 organized the Fabian Society which, while apparently innocent at the time, gradually swept forward. Winston Churchill has said that for a thousand years no alien has been able to invade the shores of England. Nonetheless, Karl Marx and his Socialists have done it. Consider the fate of "conquered" England today. Movements in many respects similar in other countries have led to several sorts of "isms" which we want no part of here.

Finally, such oaths are wrong in principle because they are in essence thought policing.

An anti-Red oath is totally ineffective in operation. Certainly it would stop no Communist. He would be the first to take it as experience elsewhere has already indicated. How many Communists have been turned over to the FBI or resigned from offices of authority anywhere because of such an oath?

In this country political oaths, other than of allegiance to the United States, and of a willingness to preserve, protect and defend its Constitution, are redundant. They are the cause of great dissension. Anyone desiring proof of this fact need only read the minutes of the Board of Regents of the University of California and the daily press during the past year. Does anyone gain by such dissension? Is any true purpose served? Only for those who desire dissension and strife.

I have had the privilege of serving my country on active duty in the Navy during World War II. I have also acted in various capacities for the Department of the Army, the Veterans Administration and the National Research Council. No other oath was required of me than that to preserve, protect and defend the Constitution of the United States against all enemies. The state and city in which I live, the various other medical and lay organizations of which I am a member, the university of whose faculty I am a member, the hospital staffs to which I belong, my associates, my patients, my family and above all my conscience do not require me to take an anti-Red oath. Why, then, does the California Medical Association impose this restriction upon me?

Is any political oath really necessary for an officer of the California Medical Association? I do not believe it is. However, if the decision is made that it is necessary, let it be an oath that any American can be proud to take—that of allegiance to the United States and to protect, preserve and defend its Constitution. This oath has been good enough for every President of the United States, for every Chief Justice of the Supreme Court and of the United States, for every holder of high executive office in our Government, for every Senator and member of the House of Representatives, for every officer and enlisted man in our armed forces. It is an oath that everyone can understand, it is positive, not negative, and it is one that only a privileged small percentage of the people in the world can take.

If an anti-Red or political oath is required by the C.M.A., then let it be this oath. There has never been a better one.

. . . After considerable deliberation based in large part on the inability of the Council to alter the oath or the requirement of taking it because it is a by-law of the association, I have agreed to take the oath of office under protest and with the fervent hope that the House of Delegates at its next meeting will abolish this troublesome requirement for the reasons I have previously stated.

DWIGHT L. WILBUR, M.D.

Executive Committee Minutes

Tentative Draft: Minutes of the 221st Meeting of the Executive Committee, Hotel del Coronado, Coronado, Wednesday, May 3, 1950.

The meeting was called to order by Council Chairman Shipman at 9:45 a.m., Wednesday, May 3, 1950, in the Patio Dining Room of Hotel del Coronado, Coronado, California.

Roll Call:

Present were President Cass, President-elect MacLean, Council Chairman Shipman, Speaker Alesen, Auditing Committee Chairman Lum, Secretary Garland. A quorum present and acting. Present by invitation were executive secretary Hunton and legal counsel Hassard.

1. *Election of Chairman:*

On nomination duly made and seconded, Dr. Donald D. Lum was elected chairman of the Executive Committee.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 9:50 a.m.

In Memoriam

DUNNE, GERALD P. Died in San Bernardino, May 8, 1950, aged 62. Graduate of McGill University of Medicine, Montreal, 1924. Licensed in California in 1943. Dr. Dunne was a member of the San Bernardino County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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FOUNTAIN, EDWIN R. Died in Santa Ynez, May 12, 1950, aged 66, of a heart attack. Graduate of Northwestern University Medical School, Chicago, 1911. Licensed in California in 1914. Dr. Fountain was a member of the Merced County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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HARMON, GEORGE A. Died in San Francisco, April 13, 1950, aged 53, of a cerebral hemorrhage. Graduate of Rush Medical College, Chicago, 1927. Licensed in California in 1927. Dr. Harmon was a member of the Placer-Nevada-Sierra County Medical Society, the California Medical Association, and the American Medical Association.

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HART, WILLIAM E. Died in Long Beach, May 14, 1950, aged 79. Graduate of the University of Illinois College of Medicine, 1898. Licensed in California in 1924. Dr. Hart was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

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HAYHURST, JOSEPH O. Died in Los Angeles, April 29, 1950, aged 73, of coronary thrombosis. Graduate of Barnes Medical College, St. Louis, 1907. Licensed in California in 1939. Dr. Hayhurst was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

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HEULER, LEO. Died in Fellows, April 15, 1950, aged 60. Graduate of Jefferson Medical College of Philadelphia, 1913. Licensed in California in 1914. Dr. Heuler was a member of the Kern County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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WINDHOLZ, FRANK S. Died in San Francisco, April 29, 1950, aged 53, of high blood pressure. Graduate of Carl-Franzens Universität Medizinische Fakultät, Graz, 1922. Licensed in California in 1943. Dr. Windholz was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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WOOD, CLIFFORD H. Died in Glendora, March 30, 1950, aged 71. Graduate of the University of Southern California, School of Medicine, Los Angeles, 1905. Licensed in California in 1906. Dr. Wood was a retired member of the Los Angeles County Medical Association, and the California Medical Association.

C.M.A. House of Delegates Proceedings

April 30, 1950

The first meeting of the house of delegates 1950 annual session (47th annual session) was held in the Ball Room, Hotel del Coronado, Coronado, California, Sunday, April 30, 1950. The meeting was called to order at 5:15 p.m. by the speaker of the house, L. A. Alesen, who presided.

SPEAKER ALESEN: Will the house please come to order? Will the delegates please be seated?

The chair recognizes Dr. Wilcox of Santa Barbara, who will give us a report of the Credentials Committee. Dr. Wilcox.

DR. ALFRED B. WILCOX (Santa Barbara): Mr. Speaker, there is a quorum present in the house of delegates.

SPEAKER ALESEN: It is now in order to move the acceptance of the report of the credentials committee, and in effect this constitutes a roll of this house.

. . . It was moved, seconded and carried that the report of the Credentials Committee be accepted. . . .

SPEAKER ALESEN: The first order of business is the announcement of the various committees required by the by-laws.

Dr. George C. Holleran of Imperial was appointed chairman of the Credentials Committee. We have just had a wire from Dr. Holleran telling us that he is not able to be present. Dr. Frey of Red Bluff and Dr. Wilcox of Santa Barbara are carrying on these duties.

Reference Committee No. 1, on the reports of officers, the council and standing and special committees, T. Eric Reynolds of Alameda County, chairman; Leslie B. Magoon of Santa Clara County and Ralph Teall of Sacramento County.

Reference Committee No. 2, on finance, to review the reports of the secretary-treasurer and the executive secretary: Alson R. Kilgore of San Francisco; Stanley R. Truman of Alameda County and G. Wendell Olson of Orange County. We have just regrettedly received word from Dr. Kilgore that he is ill, so we will substitute the name of Allen T. Hinman of San Francisco and ask Dr. Stanley R. Truman to act as chairman of this committee.

Reference Committee No. 3, on resolutions, amendments to the constitution and by-laws and new and miscellaneous business: H. Clifford Loos, Los Angeles, chairman; Wesley S. Smith, San Diego, and Ivan C. Heron of San Francisco.

Reference Committee No. 4, on executive session: Richard O. Bullis, Los Angeles, chairman; Carl M. Hadley, San Bernardino, J. D. Coulter, Lassen-Plumas-Modoc.

Does the house concur and approve of these appointments? Hearing no objections, the speaker assumes they are approved.

At this time it is my pleasant duty to present to you a man who, this morning, at the general meeting, gave what, in my opinion, was one of the most outstanding addresses that a president of the California Medical Association has delivered for a good long time. I was intrigued and beguiled and certainly stimulated by the work that your president did for us when I heard him this morning. I think it is an excellent job.

Ladies and gentlemen of the house of delegates, R. Stanley Kneeshaw, your president! (Applause.)

PRESIDENT KNEESHAW: Thank you, Mr. Speaker, for those very fine words.

Mr. Speaker, house of delegates, and friends and guests: As Dr. Alesen said, I did give an address this morning. You can read it some time later, they tell me, in CALIFORNIA MEDICINE, and so I won't give any speeches tonight. This is not a night for speech making. I have a sore throat anyway from what I did earlier today. There was no water up there or anything else, so I have had a little difficulty in getting over that. But, anyway, this is not for speeches but for business, so my words will be few.

I merely want to publicly thank all of the men who have worked on committees this year and who do the outstanding work for the California Medical Association. I am sure that many of you men do not realize the number of hours and the amount of effort that are spent by the men who work on these committees that are appointed by the council. They do the outstanding work and they have done a splendid job this year. It really is a hard job that they have to do and they are really the work horses of the California Medical Association. The men that work on these committees have much work to do tonight and so I hope that in your deliberations you will use the usual good judgment that you do use, and that is all that I can expect of you. Thank you. (Applause.)

SPEAKER ALESEN: President Kneeshaw, now you have the pleasant duty of making the presentation of the 50-year pins.

PRESIDENT KNEESHAW: Are there any men here tonight who have been in the society 50 years or more? We had a list of the men that was sent in. That list, unfortunately, is tied up somewhere between the ferry and Balboa Park, but if there are any men here, and I am sorry that I have to ask for these names, because we did have a copy of it, but if there are any men here tonight who come under that category, please raise your hands. Are there any here at all? We had word that there were about 12 that came under that category and we were hoping that some of them would be here tonight so that we could award them this little token of esteem that we have for their services to the California Medical Association.

SECRETARY GARLAND: Mr. Chairman, I would suggest we wait until Tuesday to present these men with these pins. Then we will have the list with us.

SPEAKER ALESEN: That would be a good suggestion.

PRESIDENT KNEESHAW: That is just what we will do, then.

SPEAKER ALESEN: Thank you, Mr. President.

At this time the chair wishes to recognize Leslie B. Magoon, chairman of the delegation from Santa Clara County, who has a pleasant duty to perform.

DR. LESLIE B. MAGOON (Santa Clara County): Mr. Speaker and members of the house: The Santa Clara Medical Society has asked and received permission for the holding before this house of a short ceremony which we believe to be of significance to the whole association. At this time I beg leave to introduce the president of the Santa Clara County Medical Society, Dr. Fred Borden.

DR. FRED BORDEN (president, Santa Clara County Medical Society): Mr. Chairman, Mr. Speaker, members of the house of delegates and friends: One of the most important and influential forces in our land today is that of our daily and weekly newspapers. Seven days a week, 24 hours a day, in every section of the country there are at all times members of the newspaper profession watching the newspaper reports, their city editors and service personnel, watching for developments at vital centers and even seeing that when news is made, everyone will know it. The daily lives of all of us are made by what is printed in the papers and we know we do a lot of talking about the power of the press.

All too often, however, we overlook the usefulness of the press. Through the usefulness of the press a great bulk of our population is becoming more adequately informed of the medical care that can prevent illness and save lives. Also, through the usefulness of the press, many doctors are being informed about new medical developments months sooner than if we depended solely on monthly journals. A great public service is being performed by our newspaper reporters in making people more conscious of the medical services that are available to them, either for disease detection, treatment or cure.

The physicians in Santa Clara County felt they would like to reward some of the excellent work being done by newspaper men in our area and so this year we have established a public service award in journalism. This award is open to all newspaper reporters working directly for any newspaper which has a reasonable portion of its circulation in Santa Clara County.

In addition to these newspapers which are actually printed in Santa Clara County, all of the important dailies in the San Francisco Bay Area have a very large circulation in Santa Clara County.

Our award, to be made annually, is to be given either for a single article or a series of articles on a specific subject related to medical care. To be selected for the award, the article or articles must be deemed to render a public service by bringing the public's attention to some specific medical advancement, service or facility to which persons with a knowledge of the existence of such service or facility can either improve their personal health or prolong their life span. Favorable award points will be based on the accuracy of facts appearing in the articles, the attention value of the presentation and its usefulness in public education. We are not considering articles eligible for award which overexaggerate either a favorable or unfavorable condition, which exaggerate promises of cure or unduly promise hopes for cure or recovery on false or unproven promises or which unduly publicize the services or medical treatment attainments of the doctor of medicine engaged in private practice.

Our reason for asking for this time to appear before this house of delegates was for the purpose of announcing the winner of our first public service award in journalism. Ladies and gentlemen, during the week of March 26 of this year, there appeared in the *San Francisco Chronicle* a series of articles on the subject of cancer which merits unusual praise and which constitutes a truly valuable public service. The reporter who wrote these articles took for his theme the vital matter of early diagnosis in the detection and treatment of cancer, writing in an unusual style on a difficult subject.

The author of these articles kept well within the rules prescribed by our committee.

It is with a great deal of pleasure that our Santa Clara County Medical Society salutes and presents our first journalism oscar to Milton Silverman of the *San Francisco Chronicle*. Mr. Silverman, will you please step forward? (Applause.)

Now, Milton, I don't know whether on an occasion like this I should address you as Mr. Milton Silverman or Dr. Milton Silverman. I understand you are fully accredited to both titles. In either case, it is with a great deal of pleasure that I compliment you on your very splendid work which is receiving great praise everywhere and present to you this oscar and also the check in this envelope which goes along as a part of the prize. (Applause.)

MR. MILTON SILVERMAN: Dr. Borden, ladies and gentlemen: I am most delighted and honored to accept this oscar and what is in the envelope for my editors and myself. The envelope, of course, is for myself. I would like to accept this not for any particular job which I have done but rather as a sign of many years of cooperation and many warm personal friendships that have existed between our gang and the Santa Clara gang, without whose help much of our work would be especially difficult, if not altogether impossible.

I realize it is probably appropriate for me at this point to engage in a little dissertation on the subject of what the press thinks of the medical profession, but I understand that it is the function of newspaper men to cover subjects and not talk about them. Thank you very much. (Applause.)

SPEAKER ALESEN: Thank you, Dr. Magoon and Dr. Borden.

I call attention to the fact that it was up to Santa Clara County to lead the way in this particular type of public relations. Some of the rest of us do the talking but Santa Clara, apparently, does the acting.

It has been said in our meetings that there is never a dull moment. One of the moments about to arrive is a little bit less dull than others. It is going to be a pleasure to introduce the person who is about to speak to you. I would like to say one thing. When you see her you don't need to worry about the combination of beauty and brains. She has done an excellent work for the California Medical Association and the American Medical Association. Her beauty is for her husband but her brains are for organized medicine.

Miss Leone Baxter of Whitaker and Baxter.

MISS LEONE BAXTER: Mr. President, ladies and gentlemen: When Whitaker and Baxter come home to California on our too infrequent visits for our tastes, usually our doctor friends say, "Do try to give us some inside information on what is really going on in the national campaign of medicine against socialized medicine." Actually, I have been warned there isn't very much time tonight and the truth is that most of that type of material is unrepeatable in public.

You people hear in CALIFORNIA MEDICINE what they are continually talking about with our leaders through the country in medicine and you are constantly reminded that you are the first ones to protect and preserve the profession, to put a chip on your shoulders and dare the socializers to knock it off. To somnambulent characters I presume it may seem a little peculiar, then, that there are some sections of the country where the people are even too pugnacious, and that is Washington, D. C., where there are some people who feel that medicine ought to try to win the battle for survival somehow without risk of antagonizing the Federal Security Administrator or the Anti-Trust Division of the Department of Justice or the President of the United States.

Not long ago representatives from all states met in Chicago to discuss plans for the national campaign during the coming year. We had been commenting very seriously on the fact that after all of the hard and heartbreaking work, medicine had been trying to go off the deep end, but that we finally were on the offensive. The campaign plans were based on staying there and doing such a constructive job of proving that the medical service problem can be solved under the system we now have and we believe that medicine never need be on the defensive again. Suddenly a man from Washington arose and with great delight and some wit said, "After all this talk about the defensive and offensive, I want to ask just one question. Just how offensive can we get?"

That is a very good question but actually the answer is better. Medicine has been just offensive enough to leaders of compulsory health insurance so that they are beginning to send out word in the last few weeks that they never were for it in the first place. The latest on it has been the very recent public utterance of the Chicago political boss who has said that compulsory health insurance is not a part of the Truman program. He said it is just something that Oscar Ewing dreamed up in his spare time. Seriously, there is a mighty thin line between the line of offense and defense, and, seriously, if we permit men who go to Congress during these coming elections without knowing how they stand on this issue of ours, medicine is going to be on the defensive again or maybe very soon. If we fail to continue as we are now, solving problems of medical service and medical care, medicine will still be on the defensive years from now.

I think this is the time to tell you something of the feelings of other states in respect to California's position. There have been very difficult and often disheartening times during the campaign of the last year and a half but there have been some developments helpful to the managers of the campaign and to the national committees directing it. The feeling in the majority of the states is that California already had pioneered the job and that it had solved many of the problems and that you could help to point the way.

As many of you know, it was at Dr. Cline's suggestion that the A.M.A. board of trustees tried to prepare a handbook for the use of all the states, detailing very carefully the mechanics of the best of the programs for improvement and extension of medical service. Certainly there should be included in this program for the benefit of all of the states, the program developed right here by California doctors and laymen and county medical societies and the C.M.A.

Actually, the announcement of your own C.P.S. catastrophic coverage has given greater impetus to the campaign and to the other states in the campaign than probably any other single thing since its beginning. Other states have recognized the need to find some solution to that particular problem and to put that solution into operation so that the Federal Government won't do it for them, but California pioneered the plan.

It hasn't merely increased California's prestige and stature—it has done a very practical job of bringing other states closer, in fact, to doing a similar job which on their account would require a great deal more work. Our conversations with insurance leaders, nationally, show that it has had a very great effect on the programs of the commercial carriers.

I can't truthfully say, after our talking with medical leaders in every corner of the country, that they all love you here in California, but I can say this: That they certainly respect your pioneering, constructive work, the work that you have done in the past and that you are continuing to do. It has made it a lot easier for the national committee and for the national campaign managers.

I want to tell you that when the campaign is over, as it will be at the end of this year, Whitaker and Baxter are going to be very pleased and very proud that it is California that we are coming home to. Thank you. (Applause.)

SPEAKER ALESEN: Thank you, Miss Baxter. These are the doctors of public relations who have diagnosed our case and prescribed and told us how to spend our money. They have done a good job and an explanation of the present condition will be continued by Mr. Clem Whitaker.

MR. CLEM WHITAKER: Mr. President, Mr. Speaker, and members of the house of delegates: The generous welcome which Miss Baxter and I have received since we arrived here has helped to warm our hearts after a very cold Chicago winter. I have been moved to wonder at the perversity which caused you to send us to that Siberia in the first place, but I am sure that you wished to do us a favor even if it half killed us. Seriously, we are very deeply appreciative of the opportunity that has been given us because we believe that this is the most vital battle in the most crucial struggle of our times.

During the A.M.A. mid-winter meeting in Washington, D. C., Dr. Elmer L. Henderson as president-elect of the A.M.A. made the statement, with respect to our campaign, that American medicine has come a long way in a short time. I believe there is no question about that statement but I don't believe for one moment that we can conclude that the battle is safely over. I think it is time that we took just a very brief look at both the debit and credit side of the ledger. I think it would be a good thing if we looked back to where we stood a year ago and if we looked ahead to some of the problems that now confront us.

A year ago, when the A.M.A. opened its campaign, medicine stood almost absolutely alone without a single national organization willing to take a stand beside it. This issue was considered too hot, too controversial, too dubious for many of the other great groups in the country that believe in America, to take their stand beside the doctors. Today the doctors of America can take credit, for more than 6,000 of these great national organizations of America have publicly taken their stand beside you, condemning public health insurance and promising to lend their aid and their facilities to prevent its enactment. (Applause).

That is a tribute to work at the grass roots but we can't stop there. I hope and I am willing to predict to you that by the end of this year that number will have been doubled.

A year ago we feared to take a roll call of Congress. Let's be absolutely frank about it. If the roll call had been taken last March or April, a year ago, medicine, in all likelihood, would have gone down to defeat, but the newspaper men in Washington, the political leaders in Washington and our own leaders in the A.M.A. were conscious of that condition. I want to bring you this heartening report tonight. It isn't the A.M.A. that fears the roll call. It isn't medicine that fears that issue or that condition now. It is President Truman who will not let the roll be called and, if the roll were called today in the House of Representatives of the United States or the Senate, I can tell you, you would have a grand victory that would be heard in this whole country in its fight against the attempt to socialize this nation. (Applause.)

But again, let me say this. This is only one Congress and Congress changes its complexion every two years. A year ago, and this is a very significant fact because this is the most direct testimony of what you doctors all over America have done, a year ago the mail received by members of Congress was running two and a half to one in favor of socialized medicine. Today, according to the latest check that has been taken, the mail is running three to one against compulsory health insurance. A year ago we were on the defensive but, as Miss Baxter has told you, we are now on the offensive. I think even Oscar Ewing knows that the backfire has come right up to the outskirts of Washington and he has a healthy respect for American medicine; in fact, Mr. Ewing, your chief opponent on this issue next to the President of the United States, is so dispirited that we are very fearful he will resign before the end of the year.

I want to say something about the problems which lie ahead because it isn't enough to think back on the improvements we have made on our position. This improvement has come by the exceedingly hard work by thousands of doctors all over this nation. And if you don't believe that the average practitioner finally is on fire on this issue, I would like to give you a few facts as to some of the jobs that they have done. During the past twelve months over 15,000 speeches have been made by doctors in this country against socialized medicine, ranging from great mass meetings to little meetings in farm areas, the P.-T.A. as well as many other groups, and during that period doctors from their offices have distributed 85 million pamphlets to their patients and friends. During that period we have had the greatest outpouring of mail into Congress on this issue of any issue now pending before the Congress.

We have been called a notorious lobby and a grass roots lobby. I want to say to you, ladies and gentlemen, you can be very proud of that designation—you are a fine, powerful grass roots lobby and it has won the respect of those who possibly would otherwise destroy you. Don't ever let it go down. Don't think for one moment that the politicians don't respect you because you have met them on their own ground and made them backtrack. It has been said that Napoleon and the Kaiser and Hitler never crossed the English Channel, but all we need to do is to look at the daily press today and we know very that Karl Marx did make it. There is no question but that an attempt is being made now to cross to our side of the Atlantic.

This fight in which you are engaged is not just a fight to save medicine. We are all aware of that.

You are giving heart and leadership to all of the American people who had almost lost courage in this fight to save this country from following in the pathetic pattern of Great Britain and other European nations. I look back over the early days of the fight in California when you were first mobilized, when Governor Warren's first bill was put into the legislature, and I think how far has American medicine come since that day. You have learned how to be crusading citizens. You have learned that it is not enough to be a good doctor if you want to survive and yet, too, you have learned that it is imperative that you do everything within your power to improve your doctor-patient relationships, to correct the conditions which have brought criticism upon you.

The American Medical Association is doing everything in its power to stimulate the various states to do the job which you are about to undertake in California, to spring out into a real job of patient-physician relationship, to cure some of these things which have helped bring about this agitation. But do not conclude that this attack has been brought about simply because your public relations have been bad.

Please let me issue this warning to you. Even if you had committed no sin of omission or commission in a public relations way; even if you doctors had never been guilty of overcharging in your fees or if there had never been that type of criticism at all, American medicine would still not be safe because American medicine is, in effect, part of our enterprise system and those who wish to socialize America, just as those who socialized Britain, don't want it broken down to disrupt part of our industrial economy.

They want the successful part of it because it will give them power, over-all power, in this country and because you have demonstrated your efficiency and your initiative in your chosen profession, they know they would not be taking over a sick enterprise. There is only one way that you can remain free and that is that you will stand out against this attempt to bring you under government domination. That is to be prepared at all times; be prepared to answer the attacks with a better counterattack and don't ever let anybody tell you that the battle will be over until we have completely rejected the Truman administration, until we have elected a Congress that will stand up for American things and the American way of life.

When I came out here I was a little bit dejected to learn that there were some in the California Medical Association who felt that the fight was almost over and that it was time that we were pulling our punches and spending our money otherwise, or, perhaps, at least reducing the money expended. Don't misunderstand me—I can appreciate the pressure on the members of this house of delegates from those in their districts who do not understand the seriousness of this case. But let me say this: This is no time to retreat. This is no time to let up. You, this house of delegates of the California Medical Association, brought about this great national campaign. You are the ones who pioneered it. You are the ones who woke up national medicine until the fight was made that saved your profession and this year A.M.A. is going all-out. They are going to spend over $3 million. They are bringing up all of their reserves, all of their resources, to win a decisive victory.

All of the states throughout the Middle West and the East and the other states are being asked to supplement and back that program, and what a travesty it would be at this time if the California Medical Association, which pioneered this great work, started to pull its punches. I am speaking frankly because I have a great affection for most of you and because I have only one interest and that is the interest of your association and the interest of medicine.

I am going to be specific. Yesterday the council asked me to tell you our feelings regarding your million dollar surplus. There are some among you who feel that the dues should be reduced and that the association should use part of that surplus to live on. The question was asked, "What value is that million dollars to California medicine at this time?" I made a statement to the council and I want to make it to you. It has paid you far greater political dividends than the bank has paid you in interest, strength, credit and respect in a world where there is malcontent and those who are determined to destroy you. You took the initiative in the battle in this state three years ago when there was an effort to enact socialized medicine and except for that one million dollars in the bank, you would not have been able to fight it. While this great urgency is upon you, don't ever go out unprepared.

Then I was asked to speak to you on something which is even more controversial, perhaps, than the million dollars and that is the *California Caravan* on your radio program. I want to say this to you with respect to that program. During this year when American medicine is investing $1,100,00 in newspaper advertising, in radio advertising and in magazine advertising, when it is even encouraging all of the tie-in advertising from the drug firms and prepaid health plans and insurance companies and the state and county societies to back up that program, so that you can demonstrate to our friends, to the people, before the election and so that we can dramatize the issues of socialization before the people vote on these candidates, for goodness' sake, don't consider for a moment abandoning the program that speaks to 900,000 people every Sunday afternoon as that program does.

I wonder if you recognize that Governor Warren or Jimmy Roosevelt or either one of them never speaks to 900,000 people at any one political address they give. That is the power you have and a political program, until created, doesn't have that kind of an audience. Whether you ever fire a shot in anger at the *California Caravan*, it is one of the finest defenses that you have.

I probably shouldn't speak a minute longer because I know the time is short. I want to say to you out of the fullness of my heart that this fight against socialized medicine is the biggest thing in your lives. It is bigger than any emergency that has ever confronted any of you as a doctor. Whether you continue to practice as a free man, whether you continue to live in a free America, is going to be determined without fail in the next three or four years.

Senator Taft made the interesting statement very recently that if we elect a radical Congress in 1950 there was no use to elect a different kind in 1952. Senator Taft, even though he would like to be a candidate for President in 1952, knows that. If we lose our congressional elections this year you cannot stop the essential measures of your socialistic program from going through this next Congress if the people turn us down. You have demonstrated a tremendous power not only on Congress but you have demonstrated a power to get this story to the people. But, if in the eyes of Congress, you fall short and do not get your vote out on election day, if you fail to reward your friends and punish your enemies, then medicine will no longer have the respect in Washington that it has today.

I want to say this to you. California, according to Senator Brewster, who is the chairman of the Republican campaign committee of the Senate, and according to Congressman Hall, who is the chairman of the House Committee, has the most dangerous political situation in the congressional elections of any state. The Republican party in this state is exceedingly weak, due to the fact that you don't have Republican leadership — you have personal leadership, and you men and women sitting here don't need to be told that in your California governorship race you have only one choice, the lesser of two evils.

After this election, regardless of who is elected, you will have a hostile governor's office, so you must have a friendly legislature. You must have a Congress that is responsive to American principles and I want to see California, because I love this state and I am proud to come from this state and I have sung its praises all over the country for the job it has done in pioneering—come through this year and help your A.M.A., help your profession and help America to win this very vital fight. Thank you. (Applause.)

SPEAKER ALESEN: Thank you, Mr. Whitaker. It is certainly heartening to hear these remarks by our public relations counsel.

We will now proceed with the regular agenda. First will be the report of the council, Dr. Sidney J. Shipman, chairman.

DR. SIDNEY J. SHIPMAN (chairman of the council): I have a brief additional report. My remarks will not be lengthy.

Supplemental report of the council covering items considered by the council since the printing of its report in CALIFORNIA MEDICINE, as follows:

1. The council has approved the principle of making the payment of American Medical Association dues as well as California Medical Association dues a condition of membership and instructs the chairman of the council and members of the house of delegates to introduce appropriate by-law amendments to carry out this principle.

Mr. Speaker, may I introduce at this time two by-law amendments to this effect.

SPEAKER ALESEN: Yes, please proceed.

Resolution No. 1

DR. SHIPMAN: Amendment to Chapter II, Section 2(b) and Chapter X, Section 1(b) of the by-laws of the California Medical Association.

Resolved: That Section 2, paragraph (b) of Chapter II of the by-laws of the association, California Medical Association, is hereby amended to read as follows:

(b) By failure to pay dues

If the annual assessment of dues, payable to this association and to the American Medical Association by any member of this association, are not fully paid on or before April 1 of any year, such member shall automatically lose his membership in this association as of April 1 of such year. The council of this association, in its discretion, upon payment of such unpaid dues, and any other assessments or dues accruing thereafter, may at any time reinstate such member; and be it further

Resolved: That Section 1, paragraph (b) of Chapter X of the by-laws of this association, California Medical Association, is hereby amended to read as follows:

(b) County secretaries to collect dues

The secretary of each component county society shall cause to be collected and shall forward to the office of this association the dues and assessments for this association and the American Medical Association, as levied upon the members of this association and the American Medical Association who are members of the component county society.

Continuing the report of the council:

2. The county medical societies in Alameda and Contra Costa counties have voted in their respective councils to merge the two into the Alameda-Contra Costa County Medical Society, subject to approval of the merger by a plebiscite of the two memberships.

The council has approved this merger and recommends that a charter be issued to the Alameda-Contra Costa Society if, prior to November 1, 1950, the present charters of the two existing societies have been surrendered to the secretary for cancellation.

3. The council recommends that the house of delegates elect to honorary membership Dr. Alex M. Lesem of San Diego because of his long and distinguished service in the field of public health.

4. The 1949 house of delegates adopted a resolution calling for the appointment of a committee of the house of delegates to study certain phases of California Physicians' Service. This committee has

not been appointed and the council recommends that membership of this committee be selected and announced at this session.

(I may say that I take the responsibility for overlooking this matter. Dr. Bender has called it to my attention in two letters such as only Dr. Bender could write.)

5. The council has approved the report of the Blood Bank Commission which calls for the establishment of a revolving loan fund of $150,000.00. This sum is to be used as starting capital on a matching basis, for the establishment of blood banks in several areas of California in conformity with a statewide plan developed by the Blood Bank Commission.

The council suggests that Dr. John R. Upton, chairman of the Blood Bank Commission, be permitted to discuss this project on the floor of the house of delegates and urges the house to give favorable consideration to the establishment of this loan fund.

6. The council has approved a budget for the 1950-1951 fiscal year which permits a reduction of the dues in the amount of $5.00. It will recommend that the dues for the calendar year 1951 be set at $40.00 per active member.

SPEAKER ALESEN: That part of the council's report dealing with general council problems will be referred to Committee No. 1; that part embracing proposed amendments to the by-laws will be referred to Reference Committee No. 3, and that portion dealing with the recommendation on dues and financial matters will go to the finance committee, Reference Committee No. 2.

The report of the trustees of the California Medical Association, Dr. Stanley Kneeshaw, president—and Dr. Kneeshaw, do you have any further report?

PRESIDENT KNEESHAW: The report is in the preconvention bulletin, page 10.

SPEAKER ALESEN: The report of the Auditing Committee—H. Gordon MacLean, chairman.

DR. H. GORDON MACLEAN: No further report.

SPEAKER ALESEN: The report of the secretary, Dr. L. Henry Garland.

DR. L. HENRY GARLAND: Nothing further to report.

SPEAKER ALESEN: The report of the editor — Dwight L. Wilbur.

. . . Dr. Wilbur was not present. . . .

SPEAKER ALESEN: Report of the district councilors. Does any district councilor wish to give us any further report—apparently not.

The reports of the councilors-at-large — apparently there is nothing further.

The report of the legal counsel, Peart, Baraty & Hassard. Mr. Hassard, do you have any additional report? Apparently not.

Report of standing and special committees: Executive Committee—H. Gordon MacLean.

DR. H. GORDON MACLEAN: No further report.

SPEAKER ALESEN: The Committee on Associated Societies and Technical Groups — Robert A. Scarborough.

DR. ROBERT A. SCARBOROUGH: No additional report.

SPEAKER ALESEN: The Committee on Audits—H. Gordon MacLean. Is there any additional report?

DR. H. GORDON MACLEAN: No further report.

SPEAKER ALESEN: Thank you, sir.

Committee on Health and Public Instruction — Orrin Cook.

DR. ORRIN COOK: No further report.

SPEAKER ALESEN: The report of the Committee on History and Obituaries—Robert A. Peers.

DR. ROBERT A. PEERS: Nothing further to report.

SPEAKER ALESEN: The Committee on Hospitals, Dispensaries and Clinics—Carroll B. Andrews.

DR. CARROLL B. ANDREWS: No additional report.

SPEAKER ALESEN: Thank you.

The Committee on Industrial Practice — Donald Cass.

DR. DONALD CASS: There is no additional report.

SPEAKER ALESEN: The Committee on Medical Defense, Dr. H. Clifford Loos.

DR. H. CLIFFORD LOOS: No additional report.

SPEAKER ALESEN: The Committee on Medical Economics—H. Gordon MacLean.

DR. H. GORDON MACLEAN: No further report, Mr. Speaker.

SPEAKER ALESEN: The Committee on Medical Education and Medical Institutions—L. R. Chandler.

DR. L. R. CHANDLER: No further report.

SPEAKER ALESEN: The Committee on Organization and Membership—Carl L. Mulfinger.

DR. CARL L. MULFINGER: No further report.

SPEAKER ALESEN: The Committee on Postgraduate Activities—John C. Ruddock.

DR. JOHN C. RUDDOCK: No further report.

SPEAKER ALESEN: The Committee on Publications—George Dawson.

SECRETARY GARLAND: No further report has been received.

SPEAKER ALESEN: Now here, ladies and gentlemen, is a case where we are going to have an additional report from the Committee on Policy and Legislation—Dwight H. Murray, who needs no introduction to this house of delegates. Dr. Murray, are you with us? Please come forward.

DR. DWIGHT H. MURRAY: Mr. Speaker, members of the house of delegates: I have in the beginning some bad news but also good news. For about 17 years Ben Read has served you very capably and very well. It was unfortunate that he had to undergo an operation a short time ago, to be exact, Tuesday of last week. The operation was quite successful and the patient is living. The condition for which he was operated, his doctor tells me, will be entirely re-

lieved and we expect to have Ben Read back with us again in about a month or six weeks' time. (Applause.) Thank you very much. You might understand how low I felt when I heard that he had to be operated on.

That means just this. We have some elections coming up and it means that the rest of us have to spread ourselves to cover the vacancy that is left by Ben and that I will expect you to do. I know you will and I am going to tell you shortly some of the things that I feel we have to do.

You heard a few minutes ago from Whitaker and Baxter, you heard that our fight is still on. Some time ago there was a certain man, at that time very prominently connected with American medicine, who said that socialized medicine was as dead as a dodo. That was not true then and it is still not true.

Now, coming to our California problem, the question is asked, "What shall we do about the governor? Shall we vote for this man or shall we vote for the other man?" It is a matter of record for the last ten years that the wishes of the governor, any man who has been governor, had they been satisfied, would have given us socialized medicine in California today. We would not only have it today—we would have had it ten years ago. Nowhere do we now have socialized medicine. What has been our protection? That is a very simple question. The legislature has been our protection and it still is.

Starting somewhere at the top of the list, our lieutenant governor is a very important factor and the man who is a candidate for lieutenant governor to succeed himself has certainly been our friend. He has said so. He has acted so. So, there is no reason in the world why we should not return Lieutenant Governor Knight to the position that he now holds of lieutenant governor.

The attorney general has the power and authority to give us and do us great favors. Our present attorney general has done so. Regardless of all the political fire that you may have heard—and you may realize that some of it has been a lot of, and is bound to be, politics—he has been our friend. To my mind the first principle of politics is to not forget those who have befriended you and I hope you do that with regard to this election.

We have to elect in our state this year only 17 senators. As you know, every two years we have to elect 20 senators normally but this year we have three who are unopposed. Senator Collier from Yreka and Senator George Hatfield from Madera and Merced counties and Senator Burns from Fresno County are unopposed, so that leaves 17 senatorial campaigns for us to consider.

In the assembly, normally, of course, there are 80 seats in the assembly. This year there are 12 who are unopposed. That leaves 68 campaigns.

Now, gentlemen, I want to tell you that we must return to our California Legislature the men that we now have as your friends. We must have them because, apparently, it doesn't make much difference who is elected governor, he is going to do all he can to socialize medicine, and, as I said a minute ago, the legislature is our protection. The legislature can and will protect us if we send the right people there. So let's see to it that in our districts we get the right people.

The time to talk to a man who is running for office is when he is a candidate. Don't wait until after the election. Try to sound him out and see how he feels about some of our problems, but talk to him while he is a candidate. He will listen to you then and he is much more impressionable and he will then remember or, rather, later remember the things he has then said to you.

It is so important that we not only talk to the candidates about the problems of socialized medicine but also the problem of what we call our fringe bills. These give us more headaches really than socialized medicine. What I am speaking about particularly is such bills as the naturopathic bill. Following up what Clem Whitaker said a few minutes ago, we very nearly escaped about four years ago having a naturopathic issue before the ballot for us to combat. That would have been very bad. It would have cost us lots of money. It would have cost us lots of headaches.

Such people as those are liable to come forth at any time. We have not only had the naturopaths but the chiropractors and osteopaths. There is every cult in California that anybody ever thought of. Sometimes some of our friends back East have said, "Well, why did you think that one up?" I have said. "I don't know, they must have come from some place east of the Mississippi."

Let's get busy. We must get our committees formed in the various districts—you have done that before, and you all very well know how to do it. I certainly think that we in California have the know-how. If we will just follow through again and do the job as well as you have done it in the past, I am sure that when the election is over we in the majority will be satisfied.

It is important that we elect as many men at the primary as possible. Here is the danger. If we do not, we are in danger of either one of the men who will be elected governor carrying a certain number of people, as we say, on his coattails. They may not be the men that we would desire to have represent us. So, if we can win at the primaries as many elections as possible, we then escape any threat of any man riding into the office on the coattail of the elected governor.

So far as our problem nationally is concerned, there are a great many bills before the Congress. Mr. Whitaker has stated that we would be glad to have this year, not last year and certainly not two years ago, a roll call on compulsory health insurance, but, of course, Mr. Truman and his gang are a bit astute and they are not going to let such a thing come about. It not being our bill, we can't force it. All we can do is try to needle them but they don't rise to the bait, so we probably will not have that opportunity of having the pleasure of really knocking them down at roll call.

The bills that are before the Congress, and some

of the bills are very similar, are very important to us in medicine, for they include medical education, child health care, and the inclusion in the Social Security Act of disability and many things of that nature. They have taken a lot of our time and attention on the national front.

The bills that have passed the Congress so far this year have not been inimical to our best interests. We hope that this record can be maintained, but when you are dealing with the Washington situation, to say that it is pretty tough is an understatement.

Some of our men are candidates, and I want to say something about them because it is just as important to elect the proper men to the Congress as our very own men in the California Legislature. We have running for the Senate a man who is certainly favorable to us. He is young and aggressive, a well-liked man in the Congress and that is Richard Nixon who is a candidate for the Senate. We must do all we possibly can to see that Mr. Nixon is sent to the Senate. We need him in the Senate. There are 36 vacancies in the United States Senate coming up and we must replace the ones who are going out as well as some of the ones who are there, by good men.

Of course, in the House we have them all to elect. In California we have only one who is unopposed. That is Congressman Engle. He is unopposed. Then we have 22 campaigns for Congress. Some of them are going to be tough campaigns. It is vital and very necessary that we send the proper men back to Washington. You heard Mr. Whitaker quote Senator Taft, and Senator Byrd from Virginia said almost identically the same thing in speaking to us about our position in medicine. He said that if we lose in 1950, 1952 looks extremely dark, so the way, and the only way, we can save the day, is to elect and send to the Congress the proper men.

It is very interesting to watch all of these things but at the same time very difficult. It isn't possible for me, one man, or any two men or any group of men to do it. There again, I want to say to you that it is your job at the grass roots to do this. Maybe you can do it. Nobody knows the candidates like you know them and nobody can approach them like you can, so don't neglect a single opportunity. You have in many of your counties some very capable young men as executive secretaries. I wish that we had an executive secretary in every county. These young men are capable fellows and they will do the thing that is best for us, and let's help them and tell them what to do.

As I told some of them this morning, they aren't worth a damn to look at and, if they didn't do any work, they were a total loss. So let's give them something to do. They can be and they are a great source of help to you, so let's not overlook a single one of them. They will be a tremendous power to us at all times. They can talk to people and they will do things for us that will be of great value from the political point of view.

Let's not overlook many of our friends such as men in industry. I have said this so many times that I almost think my voice is an echo, that if it had not been for our friends in industry, in business, in all walks of life, we would long ago have lost the battle for compulsory health insurance. Let's show them the way, as Mr. Whitaker said a while ago, and they will be glad to follow us. They are still our friends. We have not insulted them. We have not lost any face with any of that group so let's turn to them, also to help us. They can and they will and they are great forces for good in our behalf.

A week ago today the legislative committees of the allied professions met in San Francisco and we discussed every man who is a candidate for election, either for state election or the national election. Those of the allied professions who were present consisted of dentists, hospital administrators, dispensing opticians, pharmacists and physicians. These committees all agreed on every man that we have running for office, either on the state or national front, and they will likewise be ready to help you when you go out on your campaigns. They know because they have been told. They understand and I am glad to say that in many areas the dentists are much stronger in your behalf than they have been for some time; also the pharmacists.

The hospitals already are and we are all working together and there should be no conflict between our groups. We should look to them. If they don't come to you, you go to them and say, "Mr. Pharmacist, here I want you to help us in such and such a campaign; Dr. Dentist, we want you to get together and help us for a committee." Get together a little money for campaign purposes. That is all perfectly legal and all right and you will not be prosecuted for doing that. Thank you very much and I hope that when the campaign is over, we can say that we will again be safe. (Applause.)

SPEAKER ALESEN: Thank you, Dr. Murray.

I wonder if we all realize the amount of time and money that Dr. Murray has put in on legislation. How he has time to practice medicine, I don't know.

Dr. Sidney J. Shipman has an important matter to present to you at this time.

DR. SIDNEY J. SHIPMAN: Mr. Speaker, may I ask the privilege of having the house consider item number 3 on my supplemental report? This is the item, sir, of the election of Dr. Alex M. Lesem to honorary membership in the California Medical Association.

SPEAKER ALESEN: Is there any objection on the part of the house to consider this application at this time? The constitution requires your action and the reason for bringing it in at this time is the fact that we want to get a little notice of this in the papers. This seems to be a most appropriate time to do it. Hearing no objection, the chair will declare the matter to be in order, Dr. Shipman.

DR. SHIPMAN: I move then, Mr. Speaker, that Dr. Alex M. Lesem of San Diego be elected to honorary membership because of his long and distinguished service in the field of public health.

DR. WALTER WESSELS (Los Angeles): I will second the motion.

SPEAKER ALESEN: Is there any discussion?

Dr. Lesem has been one of the outstanding men in the field of public health in San Diego.

Is there any discussion?

. . . There being no discussion, the question was called for and the motion was put to a vote, the motion being unanimously carried. . . .

SPEAKER ALESEN: Let it be recorded, Mr. Secretary, that the vote is unanimous and Dr. Lesem has been elected an honorary member of the California Medical Association.

Is Dr. Lesem here? Will you come forward and let us look at you, doctor?

Mr. Secretary, will you escort Dr. Lesem to the rostrum?

. . . Dr. Lesem was escorted to the rostrum by the secretary, Dr. Garland. . . .

(Rising applause.)

DR. ALEX M. LESEM: Brother physicians and surgeons: In 31 years I have had great honors bestowed upon me for some work, but nothing has affected me more than this honor, being elected an honorary member of the California Medical Association. I deeply appreciate it and I will be glad to work for the interests of the profession and the ranks of the private physicians.

Thank you again. (Applause.)

SPEAKER ALESEN: At this time a motion is in order to recess, to reconvene at 7:45 in this hall.

. . . It was moved, seconded and carried that the meeting recess. . . .

. . . The meeting recessed at 6:30 p.m., to reconvene at 7:45 p.m. . . .

RECONVENING OF HOUSE OF DELEGATES

. . . The house of delegates reconvened at 8:10 p.m. and the meeting was called to order by Speaker Alesen. . . .

SPEAKER ALESEN: Gentlemen, be seated so we may come to order.

The house of delegates will be in order. At this time we will recess the house of delegates and turn the meeting over to the administrative members of the California Physicians' Service, Dr. Lowell S. Goin presiding.

. . . At 8:15 p.m. the house of delegates recessed. . . .

RECONVENING OF HOUSE OF DELEGATES

The house of delegates reconvened at 10 o'clock p.m. The meeting was called to order by Vice-Speaker Donald Charnock, who presided.

VICE-SPEAKER CHARNOCK: The house of delegates will please be reconvened.

The next order of business is the reports of standing committees. The Committee on Scientific Work—Dr. L. Henry Garland.

DR. GARLAND: Nothing additional to report.

VICE-SPEAKER CHARNOCK: The report of the Cancer Commission—Dr. Lyell C. Kinney.

SECRETARY GARLAND: Nothing additional to report.

VICE-SPEAKER CHARNOCK: The Editorial Board —Dr. Dwight L. Wilbur.

SECRETARY GARLAND: Nothing additional to report.

VICE-SPEAKER CHARNOCK: Public relations — John Hunton.

MR. HUNTON: No further report.

VICE-SPEAKER CHARNOCK: The report of special committees: Delegates to the American Medical Association—Dr. E. Vincent Askey.

DR. ASKEY: Mr. Speaker, members of the house of delegates: I will make it very brief because we are late. In the first place, I want to make an announcement. The delegates and alternates to the American Medical Association from the California Medical Association will meet in the patio dining room tomorrow with the council of the California Medical Association for instructions. Our next meeting will be held at 7:30 tomorrow morning. All delegates and alternates to the American Medical Association from California will meet at 7:30 in the patio dining room.

We delegates in whom you have had confidence and to whom you have given your support at all times wish to express our thanks to you, and we want you to know that we want to follow out your instructions. We are going to need an awful lot of help. You heard this afternoon from Mr. Whitaker and Miss Baxter. You heard them tell you that California will lead in many endeavors and many things that will be accomplished. They gave us quite a compliment but we as your delegates feel that that is a compliment to yourselves. We take a great deal of happiness in the fact that with your support we have been able to do some of the things that we feel that you want.

I am getting up to this: In San Francisco the meeting of the American Medical Association will be held beginning June 26 and through June 30. There will probably be many things brought up at that meeting which will be extremely crucial for American medicine. The eyes of American medicine are on California because many things are expected and California is expected to lead. They expect us to lead for many reasons but for one very important reason. There is one of your members sitting in the house tonight who has been a great power for California medicine. He has been a power for American medicine and he is a man in whom we have extreme confidence because he has carried our ball at a great cost to himself. Now we have the opportunity to honor this man for the service he has given us and we have the opportunity to honor this man for the service that he will give to us. California has not had a president of the American Medical Association since our beloved Ray Lyman Wilbur.

There is another man in our audience tonight, a

past president, who we firmly believe and hope will be elected the next president of the American Medical Association. I refer to our past president and worker for medicine, Dr. John W. Cline, and I hope that all of you will be up at San Francisco to give him the rousing support that he deserves.

Dr. Cline, will you arise, please, and take a bow? Dr. Cline! (Applause.)

Thank you very much.

VICE-SPEAKER CHARNOCK: The Committee on Physicians' Benevolence—Dr. Axcel E. Anderson.

DR. ANDERSON: No further report.

VICE-SPEAKER CHARNOCK: The Advisory Planning Committee—John Hunton.

MR. HUNTON: No further report, Mr. Speaker.

VICE-SPEAKER CHARNOCK: The Blood Bank Commission—Dr. John Upton.

DR. JOHN UPTON: Mr. President, Mr. Speaker and gentlemen: I will make it very brief. I wish that the words of Clem Whitaker and his very charming girl had been said by the Blood Bank Commission group because so many of the words that they used this morning were definitely directed and could be spoken by the Blood Bank Commission.

A lot of work has been done by your committee. A lot of work still remains to be done and will be done. We know where we are going. We are going to do it. With your support it is going to be accomplished.

On page 25 of your reports you can read very briefly about some of the accomplishments that have taken place this last year. It will not be necessary to go over those again.

What of the future? Simply this: Two new banks will be in operation this year. One will be in Eureka and the second will be in tri-counties which include San Luis Obispo, Ventura and Santa Barbara counties, with headquarters of the regional bank, the physical plant, in Santa Barbara. These medical societies deserve a great deal of praise for the work that they have done in the planning stages and the work that has to be accomplished and will be accomplished in these centers where blood is not being given in adequate quantities but where it can be made available to you men in adequate quantities.

There is the Riverside and San Bernardino region. That is one area. Bakersfield is an area. Los Angeles is an area. There is the Redding-Red Bluff area.

These problems will be taken on this year with your assistance. There are probably a lot of questions, but this isn't the place for them; but if you have any, we are interested in having them. We have had to face some very bitter criticism. Your support and the support of the council as voiced by Dr. Shipman was most heartening to the members of the Blood Bank Commission. Just yesterday a worker in a national agency drawing blood said to me, "Dr. Jack, the only thing that is going to beat us is lack of money." I am hoping that we will show that we will win through with the most generous recommendation of the Council. That approval is most appreciated by the Blood Bank Commission.

There is one other point for the future. At the A.M.A. meeting in June we are going to set up a regular drawing center. We will have actual venipuncture performed. It will be an educational type of program. I hope you will see it. I hope that you will all see the little display we have created in the auditorium down at Balboa Park. I hope that you will go into the mobile unit.

One thing more. Don't let anyone in this group go away with the impression that you cannot have a blood bank if your territory needs it. The ones that have even a regional type of blood bank have it controlled, created by, directed by the men who use it, the doctors, and they have ten years of experience to go by. They don't have to start from scratch any more. There is no reason at all why we cannot this year and, in short, there is no reason at all why we cannot fulfill the promise we made to you in the creation of this commission two years ago. Then, at the end of the three years, we hope with your approval and support to give adequate blood coverage at cost to everyone who needs it in the state of California.

Thank you for your support. (Applause.)

VICE-SPEAKER CHARNOCK: The Committee on Industrial Health—Dr. Christopher Leggo. Is Dr. Leggo here? (No response.)

Committee on Rural Medical Service—Dr. Carroll B. Andrews.

DR. CARROLL B. ANDREWS: No additional report.

VICE-SPEAKER CHARNOCK: The next order of business is item number 18, constitutional amendments.

The chair will recognize Dr. Clifford Loos.

DR. H. CLIFFORD LOOS: Mr. Speaker, members of the house of delegates: To begin with, I want you to understand that the reference committee to which this measure has been referred has been an impartial one. It has worked diligently and hard. It has not tried to inject its own ideas at any time into these proposals. It has tried to be a mirror to reflect back to you the different impressions that have been impressed upon that mirror.

I wish to state that without the great assistance of Mr. Hassard, our attorney, we could not have functioned. Mr. Hassard never stepped out of character at any time. He has not injected his own ideas at any time. He merely answered questions and told us when we were getting off in legal phases.

The committee has heard several of you people who have ideas and I might say that I think it is perfectly within my province to state that I think it is with scant pleasure that we can realize how little attention we, as delegates, have given to this very important document. It has been in the file for two years. It was presented to you one year ago. Nobody began to think about it until about a month or so ago, until we began to get pretty excited over it. I cannot understand why we delegates didn't pay a little more attention to this before, instead of all

at the last minute. There is no reason for that seeming lack of interest. Perhaps we think we are delegates for two sessions, for Sunday and Tuesday, once a year. That is not true. We should function all of the time.

In going over the various points of the changes or the new constitution, I first want to state that a very fine job has been done by the committee in preparing this excellent document. Dr. Sam McClendon of San Diego has been chairman of this committee and there is every evidence of hard, diligent work. It is high time that we adopted some document of this type.

The committee to which this has been referred consists of Dr. Ivan Heron of San Francisco, Dr. Wesley Smith of San Diego and myself. We have had several meetings. There was a little preliminary meeting around the first of April in Los Angeles and we had one here last Saturday which many of you attended.

In going over the different points that were brought out and the different testimony that we heard and the different listening posts we have had from the north to the south, we have been led to the conclusion that there are some things that should be altered in this excellent document. I think you have the changes we have proposed.

I think we should leave that section of the new constitution alone regarding the selection of delegates. We felt, after hearing from some of our constituents, that instead of the limitation of one delegate to a county, there should be a minimum of two delegates. Some of the men in the smaller counties felt that they should have more than one delegate present. We felt, according to the testimony that we had heard, that the councilors should have the right to vote in the house of delegates.

One of the great controversial points in this document was the redistricting and that instead of 12 districts there should be 11. The reason for that is quite obvious, if you will go down through it the way this division was made. This is a hard state to divide. It is varied in its character, in its terrain, but I think the people in California are all the same.

When you have heard today that Contra Costa County and Alameda are going to merge their county societies, it seemed only right that Contra Costa County will be added to Alameda County and not kept as a separate councilor district. We felt that there should be 11 district councilors and that there should be six councilors-at-large elected by the house of delegates, the district councilors to be elected by their own districts. This, I know, is a controversial point which you will have to thrash out at your pleasure but that was imbedded in this change because of the testimony we have heard favoring councilors-at-large.

Also, it was felt by many that the size of the council should be changed. We feel if that is put into effect, with 11 district councilors and six councilors-at-large, it might give an undue advantage to Los Angeles County. So it is proposed that the vice-speaker be eliminated as a member of the council. In redistricting this you will note that District No. 10 is divided into Districts 6, 9 and 12.

Now that you have copies of this document you will have plenty of time to study it and discuss it later on. There has been a point brought up by many that the house of delegates should have some rights as to powers over the seating of councilors elected by the various districts. That is a controversial matter. We think we have hit upon a system where we can have that worked out and still not cause injury to anyone.

I want to read this Section 11, which is practically new.

"District Councilors shall be elected by vote of the Delegates from each district in the manner and at the time specified in the By-Laws; provided, however, that at the first meeting of the House of Delegates after a District Councilor has been selected, his name shall be submitted to the House by the Delegates from the district, and (1) if there is no challenge by any Delegate then the Speaker shall declare his election completed, and (2) if any Delegate shall challenge the election on any ground, including fitness of the nominee of the district to serve as a District Councilor, the questions presented by the challenge shall be submitted to a Qualifications Committee consisting of the President, President-elect and one Delegate, appointed by the Speaker, from the Councilor District involved. The Qualifications Committee shall consider all grounds upon which the nominee is challenged and report back to the House. If the Committee reports in favor of confirming the nominee's election, the Speaker shall declare him elected. If the Committee reports against confirming the nominee's election, a three-fourths affirmative vote shall be necessary to sustain the report of the Committee, in which event the nominee shall be ineligible to serve as the District Councilor and the Delegates from the district shall immediately proceed to the selection of another nominee for the vacant office. If an adverse report of the Qualifications Committee is not sustained then the nominee shall be declared elected by the Speaker."

There is an error in this section. I will read the section, calling your attention to the error.

"Councilors-at-Large shall be elected one by one from nominations made on the floor of the House of Delegates. Not more than two Councilors-at-Large shall be elected from any one 'county'."

It should read instead of "Councilor District." That will be corrected next Tuesday night.

A new section has been added or recommended added, reading as follows:

"Upon the adoption of this Constitution, the Councilors-at-Large holding office at the time of the adoption shall serve the remainder of their terms of office specified in the previous Constitution and as their terms expire successors shall be elected in the manner and for the terms provided in this Constitution."

The committee feels in view of the information it has received from various people that these changes should meet the requirements of all the

objections we have heard. The committee feels—in view of the necessity of making these changes as brought forth by testimony presented to the committee — and the committee recommends that the constitution as presented at the last meeting of the house of delegates be not voted favorably upon at this session. Thank you.

VICE-SPEAKER CHARNOCK: You have heard the report of the reference committee and the question is now open for discussion by the floor.

I think we will recognize first Dr. McClendon, the chairman of the committee who got together this constitution. We must be sure that each speaker will speak on the proposed constitution, the proposed instrument, which Dr. McClendon's committee is submitting, not the changes which Dr. Loos' committee has suggested.

DR. MCCLENDON: I have had considerable experience with this association and the A.M.A. and I will be very brief. I think that Clifford Loos and his committee have done a very grand job. I believe probably I have come forth with an acceptable formula which may be adopted by this house. However, if we present new ideas every year they will just have to lie on the table, as I would like to remind you that the substitute constitution and by-laws which Dr. Loos' committee has presented to you will have to lie on the table another year, and then probably at that time it will come up with some more objections, just as they have this time.

Frankly, your constitution and by-laws committee has worked two years on this thing in an attempt to do two or three simple things. They are simple and this matter that has been discussed tonight by Dr. Loos is not very much different than what we proposed in the beginning. First, we took out of the constitution those things which were needed in the by-laws, those things which can be changed easily and which may be subject to change readily.

Secondly, we in the State of California intended in our original constitution, 12 councilor districts. I can't see how you can divide 11 by three. That was in our original draft and it was also proposed that the councilors be elected by districts, by the delegates from the areas from which these councilors came, and we still think that is the thing that should be done. I still contend that is the best deal from a representative standpoint.

We propose that the delegates be elected by the members of the component societies, not in the manner that has been so prevalent in the past in various county societies, and that means all of you sitting here now. We all want the delegates to this association feeling they are of some importance and they cannot be selected in any other way. They are now being elected for different terms of office but the only change that was suggested in the present constitution as it was presented was that the council, in the expenditure of money, should, by a three-fourths majority, approve the expenditures beyond the budget. That is just a reasonable and business-like thing. After all, when your delegates are dealing with money of the type that we have and may have to spend, if and when an emergency should arise, certainly it would be only a fair safeguard to have at least three-fourths of the council approve that expenditure.

These are the three fundamental changes that were suggested. One of my friends and colleagues got up and waved a flag and said that if we continued under this proposed constitution, we would have communism, but that wouldn't be true; that we would be hamstrung in the expenditure of money, and that is not true.

If you will look at the old one and see all the little stickers stuck through here, you can realize and understand just what has been done. After all is said and done, my committee, and I would like to thank them again, as I did last year, has spent a whole year on this, 16 of us the first year and five or six of us the second year, meeting many times, a full day at a time. We have worked with the assistance of your legal counsel, Peart, Baraty & Hassard, and I can assure you if it had not been by request of this house that the constitution be rewritten, I wouldn't be standing up here trying to talk to you.

If you don't want it rewritten, it is okay with me. I do think that any of you who read over the whole constitution will recognize the necessity for streamlining this document and removing the amendments and amendments and amendments. Also, I would like to say here that if we continue to propose a new constitution, but not in criticism of some of the suggestions of Dr. Loos' committee, that the same thing is going to go on next year just as sure as I stand here tonight. It took us five years to get the constitution of the American Medical Association rewritten and it will take us more than ten years here. (Applause.)

VICE-SPEAKER CHARNOCK: Thank you, Dr. McClendon.

Further discussion is in order and we limit the discussion to the proposed new instrument, not the changes as outlined by Dr. Loos. Do we have anybody else who wishes to discuss this new constitution? Dr. Magoon.

DR. MAGOON (Santa Clara County): Is it in order that I use the podium, sir?

VICE-SPEAKER CHARNOCK: We want you to do so.

DR. MAGOON: I open these remarks with the unquestioned statement that I am in favor of the old constitution, the one recommended by the special committee. I am happy to add I was a member of the committee, the fruit of whose labor has been reported. Whatever may be the result therefrom in the way of bias, you may see for yourself.

First, the lesser virtues of the proposed constitution. If you have ever had occasion to seek a point in our existing constitution, you will agree with me, I think, that it is hopelessly disorganized, full of redundancies, inconsistent, and verbose to the point of frustration; if the proposed constitution corrects only this fault of the old, its adoption would save untold man-hours of labor and prevent the curdling of many otherwise sunny dispositions.

That the new does correct this fault in the old, I am sure you will concede, if you will but count the printed pages that each occupies. Besides being brief and concise the new constitution in a large measure more closely follows our desires in planning a constitution and the scheme of the organization, the goal of the association, outlining the broad and presumably permanent principles of the organization, and transferring to the by-laws those matters of operation and procedure whose details presumably might require at least occasional revision.

May I caution you therefore that you do not let a revision of the by-laws, with which you do not agree, color your thinking in considering this constitution. Technically the proposed by-laws are not even introduced. I believe that the revised version of the by-laws is ready for introduction and the reference committee will introduce other changes as a result of a hearing held yesterday. Even if those revisions still fail to meet your objects, may I point out the revision of the by-laws is comparatively easy and quick and I ask again that you make your decision on the constitution solely on the basis of its own merits and not of these subsidiary documents.

The hearing of the reference committee makes me believe that the only important controversial process of the new constitution is the organization of the council. I should like to discuss that subject at some length. I feel I am correct when I say that this original impetus resulted from a statement of the committee that drew up this proposed constitution and it was dissatisfied with the council as it is now organized. I refer you to the proponents of the original resolution to confirm what I say. On what was that dissatisfaction based? It was based on the belief that the council as now constituted is vested with full and complete power to commit the California Medical Association as it may see fit without any effective check or balance by any other authority within the association. In no other organization with which I am familiar, unless it be the hod carriers' union, do I know of an executive and quasi-legislative body which has such indefinite responsibility to its membership. That this power has been wisely and temperately used in the past begs the question.

The question then to which your committee seeks an answer, simply put, is this: How can we provide simple and effective changing over of the powers of the council without at the same time rendering its impetus ineffective? The answer seems to us to apply to the council the principle of representative government whose validity has been demonstrated by the 175-year history of the American government.

This would mean that each council member would have a constituency by whom he was chosen and to whom he was directly responsible. That to us meant that each councilor would be a district councilor and the councilor-at-large would be eliminated. That was accepted by both committees. The present constitution dictates that councilors-at-large come from the larger counties and districts, but there are counties from whom they are elected as a whole and not by districts from which they come.

It can be, and on occasions it has been, that the councilor-at-large is not the choice of a majority in that district. What support will this councilor receive and what sense of responsibility can that councilor have from his home county? Can anyone urge that such a situation is healthy, that it is for the benefit of the California Medical Association and that it does not entirely negate the principle of representative government? If we want representation in the council in the more populous areas, we had better watch this matter.

If, on the other hand, the councilors-at-large do represent the majority of the district, it is more consistent, more desirable and theoretically correct that they be elected as district councilors, that they be responsible to their districts directly and not filtered through the house as a whole.

I have been told in the past that councilors have never disagreed on the basis of north versus south or urban versus rural. That is a happy situation and there is no reason why it should not continue. To my mind there is no basic difference in the interest of the doctors. There should be no difference of opinion held by the doctors in the cow counties and the doctors buried in a metropolitan center.

The object of the committee in providing for geographical organization of the council was not to balance voting power but to assure that every member of the association would have a representative on the council whom he considers his own and whose responsibility to him was dictated only by the delegation of his own district and not by that of the whole state. That was the check on the council, the application of which is believed necessary and one to which no fair-minded councilors should object.

That leads to another point on the basis of the information originally told to the committee at the time when a small council seemed desirable. It now seems that the committee work of each councilor has attained a greater speed. It would not invalidate the principle of representative government and it would not be inconsistent with our thesis, and I have become convinced it would be in the best interests of the association, if the size of the council were increased. I would therefore suggest an amendment that provision be made to increase the district councilors for three or four of the larger councilor districts. I would also propose that in spite of the sparseness of the medical population but because of the tremendous geographical areas involved, the two northern districts be split so that we have two new districts, one centering around, say, Eureka, and one around, say, Redding. If these be created, this would result in a council of adequate workable size.

I have said that these changes should be accomplished by an amendment of the proposed constitution. I am wholly opposed to further delay in the adoption of the new constitution and I am sure that the council will carry the load for a year until its

membership can be increased in the manner I have described.

One more point. I have heard it said as an argument against the proposed constitution that the present council should not summarily be dismissed in entirety until the new council is chosen, but examine this argument more closely. Admittedly, some of the old council members will be out of office as this redistricting will cause some changes, but otherwise it seems to me that the present council, which is well represented from the districts and efficiently doing its job, should certainly be reelected. Does anyone wonder that a councilor who does not meet this criterion, who does not command the support of the majority of the delegates from his own district, should not be continued in office? I will be glad to explain what I believe to be the obvious answer.

In summary and in conclusion, may I say that I feel, frankly, that the merits of the proposed constitution far outweigh any demerits that it might have and I believe that it will bring to the California Medical Association true and valid principles of representative government whose application is long overdue.

I respectfully solicit your support for its adoption. (Applause.)

VICE-SPEAKER CHARNOCK: We will continue the discussion. Dr. Caldwell.

DR. CALDWELL: Mr. Speaker, members of the house of delegates: This constitution is not a perfect instrument but Dr. McClendon has told you it represents the intention and efforts of some of the finest minds in the state of California for the past two years. If this constitution were perfect we wouldn't have set machinery in motion for amending it.

Dr. Loos' committee, as others of you, believe that it should be amended. I agree but I believe, first, that it should be adopted and then amended. We can live with this thing but we must not forget one thing. My understanding is that it is proposed to amend it this year, then again next year and the year thereafter until we will not get a streamlined workable constitution. For those of you who are lucky enough to be delegates and lucky enough to be alive, you will be attending the sessions in wheelchairs and still working on this constitution.

I would like to mention a couple of things that have come to my mind which stand out in the new constitution, the new proposed constitution. One is direct election of councilors. It is proposed that by secret ballot the delegation will be elected by members of the county medical societies. Now, that, to me is the only truly representative way and the American way. Also, it abolishes the councilors-at-large. This, as you know, is the situation where a councilor living and having his office in one county represents and is elected by the state as a whole and represents the state as a whole. We are told that a councilor is supposed to visit the district at least twice a year. If the councilor-at-large had to visit each county twice a year, I don't think there would be so much competition for the office.

In the old constitution there are a few words which I think bear mentioning. They are "promote the betterment of the medical profession." I think it is about time that we begin to forget personal ambitions and begin to forget fancy loyalties to certain political groups and begin to think of the good of the entire membership of the California Medical Association. (Applause.)

VICE-SPEAKER CHARNOCK: Dr. Cline.

DR. CLINE: Mr. Speaker, members of the house: I think I have no fanciful loyalties to any particular group. I served on the council of the California Medical Association for a period of about ten years.

If you adopt this instrument, you are going to change the whole plan of the organization of the California Medical Association. This house of delegates is chosen by the constituent county societies throughout the state. This is a truly representative body which gives the representation which certain speakers have implied as inherent in the American system.

DR. RICHARD O. BULLIS: A point of order.

VICE-SPEAKER CHARNOCK: Will you state your point of order?

DR. BULLIS: The gentleman speaking is not a delegate or a member of the house. He is speaking without permission of the house.

VICE-SPEAKER CHARNOCK: We will ask for permission of the house so that Dr. Cline may speak. Those in favor of Dr. Cline speaking will say "aye" and those opposed "no".

. . . A vote was taken with the "ayes" in the majority. . . .

VICE-SPEAKER CHARNOCK: Dr. Cline will be allowed to speak.

DR. CLINE: Thank you, Mr. Speaker.

The members choose their own delegates and these delegates simply carry out the wishes of their own constituents. The council has an entirely different function. The council does not expect, instead of the house of delegates and on behalf of the house of delegates and between meetings of the house of delegates to determine matters of policy. It is primarily an administrative body. It conducts the business of the association. One speaker said that he knew of no other organization in which such powers were vested in a comparatively small number of the membership but he never read the constitution of the American Medical Association. Their power and that of the board of trustees exceeds those of the council of the California Medical Association.

It also happens to have been my experience, being a member of the council and being chairman of the executive committee in the hectic days of 1945, 1946, and 1947, that we found many times when actions must be taken immediately. The house of delegates cannot be assembled. The council cannot be polled immediately to obtain a three-quarters vote. Such things would have to be explained, such details as

were incurred. They would have to be explained very carefully under these circumstances to all of the members of the council. Then we would have to have the three-quarters vote to exceed any budgetary provision that the house would make. If you don't trust your council, if you don't trust the people that you elect to conduct the business of this association in an emergency, then my thought is that it is not the system which is at fault but rather the personnel.

I would also sketch the history because I am intimately familiar, as was shown here, that this whole idea of the constitution such as now proposed here, arose not out of the efforts to improve the instrument of the association but rather out of dissatisfaction with the then current personnel of which I was a member. I, therefore, realize that this, in order to pass, must take two years and that we now have an entirely different construction to place on it.

I think there is another serious defect. You have heard the councilors-at-large assailed. If you will recall, and I think I am correct, that Dr. McClendon was a councilor-at-large, Dr. Sidney Shipman, the present chairman of your council, is a councilor-at-large, Dr. Ed Bruck, your recently presiding chairman of the council, was a councilor-at-large. I could go on indefinitely mentioning the valuable men that the association has had, the men who really have carried on the work, and they have been councilors-at-large. If you eliminate the councilors-at-large you would eliminate immediately some of the most important people whom you have serving you, possibly replacing them with equally competent individuals.

There is another thing I would like to speak about. That is that this instrument also proposes to reduce the size of the house of delegates. For the past year and a half I have been intimately associated with the idea in an effort to educate doctors to their responsibilities, to their profession, and to get them to do a real and realistic job in the protection of America.

DR. MAGOON: May I at this time rise to a point of order?

VICE-SPEAKER CHARNOCK: State your point.

DR. MAGOON: This gentleman is not speaking on the constitution but the by-laws, sir; not the constitution.

DR. CLINE: I stand corrected.

VICE-SPEAKER CHARNOCK: Will you keep then to the constitution and discuss it only. That is what we have before you.

DR. CLINE: I shall try to, sir.

I shall simply make one other comment with reference to my ideas and that is this: That the larger number of people who would be intelligently acquainted with the business of this association, the better it is going to be, the greater is going to be our strength and the better the functions of the California Medical Association. Thank you. (Applause.)

VICE-SPEAKER CHARNOCK: Is there anyone else who would like to discuss this subject?

DR. MARDEN A. ALSBERGE (Los Angeles): I agree with the previous speaker, that the new constitution would make some radical changes in the way that the body is organized and the way this body is functioning. I am one of the individuals that believe a few radical changes are necessary. I believe that the councilors are a vital necessity in this organization. I believe that the delegates should be elected by their own constituents. I do not believe that it is possible to have proper representation without responsibility and if the men are not responsible solely to their own counties direct, they do not have that responsibility. I have heard that the council has found it necessary to act at times, in the absence of a meeting of the house of delegates, in certain emergencies. That is certainly true and that will continue to be true but certainly I believe that it is necessary to curb considerably the powers of the council.

I wish to cite one example. On this floor, gentlemen, just a year ago, there was a resolution presented in the meeting of California Physicians' Service. The resolution to which I refer was a 50 per cent reduction in the radiological fees. To be very brief, it was the first time in my memory that there has ever been brought up a discussion on such a proposition so controversial as this has been and which so unanimously expressed the will of the gentlemen seated here tonight. After three calls from speakers, there was not even a second.

However, the council found it necessary this last year to approve in principle, according to the minutes of the association, not only this fee schedule but, coming under this bracket also, the pathologists, approving in principle the setting up of a committee to sample the work done by the physician participating member as to whether or not his work was adequate and satisfactory. This I do not believe was an emergency, an emergency that arose at the moment. I believe that this situation could partially be correct and I cite you this one example. There are others. I believe the situation could not arise quite as readily if the council members were responsible to the men who elect them.

I believe that every councilor district has the right to say who will represent them and I believe that that councilor district has the right to hold that man accountable when he returns to his district. It is not possible for this state of California, the medical association, the whole councilors-at-large, to be responsible for anything when the councilor returns to his district to report and that represents but a small portion of the whole.

The main question, it seems to me, is to decide whether or not we need a new constitution. A lot think we do and a lot think we don't. If we do determine that a new constitution is necessary, we must at some time in presenting a new constitution, take action. There will be many delegates who will wish to appear before Dr. Loos' committee. Every day there are men and groups of individuals, I being one, who definitely and irrevocably would object to certain portions of the new constitution or the sug-

gested constitution. I am opposed to several phases of it but I will put up with it until they are changed. However, with as many matters as there are to the new constitution and with a group of 50, possibly, here opposing it and the group of ten over here opposing it and another group of 15 here opposing it, it seems that the total opposition to the constitution is overwhelming. Then, if we pass it on to another year, then this body changes by about 50 per cent. The new crop has new ideas and new changes.

First we must adopt a constitution. Then, if necessary, later, and I believe it will be necessary—every speaker has suggested that it will be necessary—we can change it. If we don't adopt the new constitution tonight, we can suggest additional amendments to the present constitution and they can lay over and be adopted next year, just as you would hold the whole constitution over with the suggested changes of the reference committees, and they can be adopted just as quickly; yet we will have a constitution but we will wait until next year when members of the house of delegates will make new objections. This in turn will hold it over for another year and this will go on continually, indefinitely, gentlemen, for years, but if we are going to have to get our feet wet, I suggest and propose we get them wet tonight. (Applause.)

VICE-SPEAKER CHARNOCK: Is there anyone that wants to discuss this important matter further?

DR. WESLEY S. SMITH (San Diego): I have been listening to the very interesting observations and in this very short time when I am on my feet, I wish to say that most of the speakers that have objected to the rejection of the constitution, as printed in the December journal, have closed the issue by getting over on to the by-laws consideration rather than sticking principally to the constitution.

Your committee has listened long and hard to many objections to the constitution as printed in last December's journal. I want to remind those that have spoken so far tonight that none of them has given credit to the fact that the committee that studied the constitutional changes reported it to this body too late for open discussion or for those to attend that reference committee and discuss these changes; therefore, the statement that next year we will have to make more changes and then more changes is not based on fact. The fact is that this body tonight is the first one that has had any opportunity to criticize this constitution other than the committee itself.

I believe there is a final fact that we shouldn't overlook. I think that Dr. Cline made some very fine suggestions and I think it should completely negate the suggestion that the councilors-at-large do not represent either their constituents or the state, for I should like to add a few more: Francis West from San Diego; Ben Frees from Los Angeles; Gordon MacLean from Oakland and C. V. Thompson from Lodi, and those of you who are experienced know that no matter how far back you go that your best men on the council have been councilors-at-large. The councilors-at-large have been a safety factor and we must realize that there never has been very much difficulty when we have had changes in growth in the state and if anybody here wants to predict where that is going to be ten years from now, let him. I am not much of a prophet, but there are going to have to be certain changes.

I would like to make one further point. I should like to see this controversial point regarding the council put over but I guess it is legally impossible as the council is the basic controlling body of our organization. That answers the point that the controversial points were put into it by law. It cannot be done as far as the council is concerned. I think the fact that we are interested in, and on which I think we are entitled to some discussion, and I believe the record will show a year from now that with the changes that your reference committee has suggested which are based on the oppositions of the people appearing before them, the bugs will be pretty well ironed out.

I would like to adopt the constitution Tuesday night and which on Tuesday night will have had five amendments made to it, and, in all probability some more, and so that next year, if somebody has a copy of the constitution, you will open it up and see on page after page little pieces stuck on it and no one can find their place. So let's make a new one from tonight. I think we are all a little bit confused tonight. I think we shall make a very grave error in our confusion, because this is our first time to criticize the instrument.

The committee did a fine job. There is nothing changed except to adjust, in effect, questions which were considered, in part, based on the Contra Costa combination with Alameda; partly because it leaves a district which is not laid out right and partly because there is an objection, which is objected strenuously, to the way the council has laid out two sections in the city and county. This leaves it up to them to make their own decision. The other change is that some small community would be deprived of an extra delegate. These all seem reasonable to our committee. That is why I should like again to suggest that if you want to adopt the present constitution, then go ahead and amend and amend and this session will still lay it over for a year. We felt it was better to reject the present constitution but use it as a principal guide to make these other changes which can be done now, laid on the table a year and then you will have a useful document.

Thank you very much. (Applause.)

VICE-SPEAKER CHARNOCK: The chair will recognize Dr. Remmen.

DR. E. T. REMMEN (Los Angeles): Mr. Speaker and members of the house: I had thought of talking about an hour tonight on this subject and including a few stories but time is very short, so I will omit all of that.

It was my privilege to serve on the first committee which worked on this revision. The committee was a representative group which came from all over the state. They worked very long and very hard on it. The committee tried to reconcile the rights of

the large congested districts and the sparse rural districts by selecting the council on a geographical basis and the delegates on the basis of population. I think that is done very equitably, as equitably as possible, in the new constitution as proposed. It probably was not dissimilar to that which confronted the founders of this country who had likewise to adopt a system of government which was fair to New York City and to the remote wilds of the less densely populated colonies.

I was rather amused at the statement that our best councilors have been councilors-at-large. That is unusual in view of the fact that there are so many more district councilors and the fact that they have all been elected in the same way by the house of delegates. I wish I had time to tell you some of the things that went through the minds of the committee that worked on this matter. It went through my mind and I have no doubt through the minds of some of the others.

The reasons for reducing the house of delegates were several. One, the possibility we would, because of the press of business, come to two sessions of the house of delegates a year. The second session would possibly not be a convention and it would only be natural that the California Medical Association would defray the expenses of the house.

DR. MAGOON: I again rise to a point of order.

DR. REMMEN: I am sorry. That does relate to the by-laws.

There is one thing we all remember. While the house of delegates, including many men with experience, voted for compulsory health insurance, I don't think that our council, during the 15 years or 20 of my acquaintance with it, has been entirely infallible. My mind goes back to the survey of the state that determined whether we needed some form of health insurance which was conducted by Professor Dodd of the University of California at Los Angeles. Then you know about that $50,000 or $60,000 survey for which we paid, which was used against us. I am sure you all remember the Foote, Cone & Belding outlay, another very extravagant expenditure, which this council, which has never made any errors, carried on, in order to find out whether the people like us and what they thought about us. We know what they thought about us; we know how they liked us but they didn't like our fees. We didn't need that survey to tell us that. We then got our survey and as a development of that we went out and hired a public relations firm and we hear continually of what a wonderful job they are doing. I hope they are.

From a practical standpoint, however, may I remind you that four years ago here in California we had indemnity for illness added to the unemployment insurance law. Two years ago we became the first state to have hospital insurance added to it and we will probably, if we aren't very fortunate, have indemnity for medical care added to it in this state where, through publicity, we have kept government medicine out.

Now, let's be practical about it. That is the present situation of California. We are the nearest to any state to have the whole bill and on the strength of that we went back and sold our public relations firm through their work to the A.M.A. That is all I want to say on that. This council that represents the carefully considered thought of a large group of men, who have not been desirous of holding office, did the best they could with the thing. If it is wrong in a few places, if it doesn't suit everybody, I think the simplest thing is to say that we have a constitution which already needs revising. Why, the Lord himself couldn't write a constitution that would suit everyone. It will probably be necessary to amend the old one but with this constitution we can start afresh and then if you want to amend it next year, you can. At least it is something of a modern and a scientific constitution. I hope you will adopt it. (Applause.)

DR. JOHN W. GREEN: Mr. Speaker and members of the house: I have served about ten years on this council that you are finding fault with—very sorry. I have done the best I could with the tools I had. However, I don't want to apologize so much as to point out to anyone of the organization, as a member of the council, that my idea of the councilor-at-large is this: They have been the balance wheel of our council and the many acrimonious disputes which we have had which were dealing with local problems — they might be dealing with San Diego, they might be dealing with Sacramento and they might be dealing with some other locale—and, naturally, the councilor representing that district is going to present the ideas of his constituents. That is what he has been elected for—to represent them and carry their ideas to the council.

Sometimes he had a pretty good battle on his hands. It sometimes gets pretty tough and I have seen it get awfully tough about four times. In every instance, if my memory serves me right, the councilor-at-large was the man who was broad enough to do what was good for medicine in California.

We have had threats of secession. Nothing happened. Why? It was because we had a pretty good council. Otherwise this might have happened.

I would also like to say this about the right to vote and I don't believe this is in the by-laws. I don't believe you can ask any councilor to serve you for three years and then reelect him to serve you for three years more. He gives up his business. He has fights with his wife. He does everything that is bad for him, to serve you, and still, in spite of all that, this new constitution recommends that he will have no vote on the floor of this house. I don't believe that is just exactly what you gentlemen would like to have your councilors do. I can't believe it but it may be so. Maybe it wasn't properly discussed.

I do want to say in closing that Clifford Loos did a good job in the spot that he had—you didn't like it, I know, but it was advertised, at least to me, that that meeting would be held at the time specified. Everybody, I think, had just as much chance as I had to go there and express his views and I hope you do not accept this constitution, because, if you

do, you accept it in toto and there is nothing in there, in accepting it, that you will amend. (Applause.)

VICE-SPEAKER CHARNOCK: Is there any more discussion?

DR. ASKEY (Los Angeles): Mr. Speaker, members of the house of delegates: Somebody said one time that the only ones that the American people have any confidence in at all are those they are about to elect. After he is elected everybody shoots at him.

Now, it doesn't seem to me that we have any reason to go back and say whether Sid Shipman or whether I or anybody else was a good councilor at the time they were on the council. They did the best they could. Maybe we didn't like it. Maybe they made mistakes. That is not the point at issue now. The point at issue is this: There is a proposed new constitution before us which is detailed and cannot be changed at this time by one single semicolon, period or comma. If you adopt it, you adopt it as is and it will then be your constitution. It will change the whole set-up of the California Medical Association and everything that is now being done is wrong. The people who will be the new council will immediately have to be elected and you will have to get a whole new crowd. It may be that you will elect some of the boys that have been in if you still have confidence in them but you are going to have to set up a whole new set of things at this session of your house of delegates. If you adopt it, from that minute tonight everything else is out.

Everyone that I have heard speaking tonight agrees that there are changes in this proposed constitution that must be made. It wouldn't be right to follow it and go by it until these changes were made. Now, if these changes are not made, you are then going to go for a whole year on a procedure which may upset everything that we are trying to do. There will immediately be jostling for positions; there will be those who are working for this and that and this session at Coronado will end up in the greatest turmoil that you ever saw.

If we have to have amendments I believe that they should be right. I agree that the other constitution could be well changed. It seems to me that you have had a committee studying this thing and looking at it from all angles and what does this committee say? It comes in and says, "We believe that there are certain good points in the proposed constitution but there are lots of others that are very, very bad and therefore we think that it should be changed."

Now, gentlemen, which would be better, to continue with the troubles which we have and which we understand but which we can change, and we intend to change, or to put on our books not only the troubles which we already have but all the rest of them that will come in addition? It seems to me that it would be very wise to continue with our old constitution and have this committee which recommended the changes which they want, introduce them at this time to be considered and put into effect next time.

You are going to have the same thing done if you adopt the new constitution and you are going to have so many troubles on your hands that nobody will know where we are. I cannot see in my own mind how I or you can give the balanced thought to this at this short meeting tonight that Cliff and his committee have given to it. In my opinion, they saw the best thing to do and that was to recommend at this time to reject the proposed constitution and, instead, take this proposal and then you have something that you can build on. It is conceded that you have some troubles, but we can understand the troubles that we know. The troubles that are going to bother us are the ones that will inevitably pile up on us with new changes and I therefore hope that you will reject this and ask your committee to introduce your amendments which they think will solve the problems. Then let us, if you wish, have this committee as a special committee, to study this and have hearings during the year on this and then, when we come back next year, we won't sit here cold turkey but we will have the additional reports which they will have at that time.

I sincerely hope—and I have no axe to grind any more—you have given me every honor in this association, most of which I didn't deserve, but which I feel very humble for—if you believe my advice is worth anything, and you simply believe it or you don't believe it—that is up to you—but my advice is to reject this proposed constitution and go at it in the right way. (Applause.)

VICE-SPEAKER CHARNOCK: I want to give everybody an opportunity to be heard. Dr. Bullis from Los Angeles County.

DR. BULLIS: It seems to me the question before the house tonight is whether you wish to accept the suggestion and recommendation of the two committees, one for a period of two years' hard work, a committee of 12 or 15 men, and one committee of five, or whether you wish to set that judgment aside and accept the recommendation of the committee of three who have worked for a period of a few days. The chairman of that committee had not even read the constitution, I believe, until he was appointed chairman of the committee. I think that it stands to reason that the work done by the two committees—unfortunately, I happened to be on the last one—but I think that the committees working with the same legal advice would be better to follow than the one committee in a short time. I respectfully urge that the new constitution be adopted and any variations that may be needed could be proposed and laid over for a year.

VICE-SPEAKER CHARNOCK: Does anyone else wish to speak to this?

DR. WILLIAM G. DONALD (Alameda County): Mr. Speaker: I would like to say a few things because I was on the committee of the original 15 men and, after listening to the debate here tonight, several curious things have come to mind. This committee on the proposed new constitution was obey-

ing the house of delegates mandate that the constitution of the council be changed. That is at your suggestion and demands. I have been very interested for two years in this constitution and during the past month, since it has been published and studied by quite a number of members of the house of delegates, I find no one criticizing the omission of the council but those who are councilors or who have been councilors.

I regret that Dr. Cline has put this on a personal basis, aiming at individual councilors. No such thought was in the mind of the delegates when they asked that the formation of the council be changed. It wasn't a personal matter. Councilors have been invariably leaders of our society and great men. There is no reason in the world why they shouldn't still be the same councilors.

These committees of 15 and five, then, have studied this thoroughly with your demands in mind and have brought forth this constitution. Your reference committee has not even studied it two days. The speakers in general here have not given it as much thought as the original committee acting at your behest. If opinions are to be considered, I certainly would consider the 20 men who have studied it for two years far ahead of those off-the-cuff opinions and I would urge you to accept the constitution as proposed in toto. (Applause.)

VICE-SPEAKER CHARNOCK: Does anyone else wish to discuss this instrument before we vote on it?

DR. J. E. YOUNG (Fresno County): I did work on this committee but there is no reason why, after new information is obtained, that opinions cannot be changed. You have discussed the government of the California Medical Association to great extent. It has been very interesting but it would also be very interesting to look into the proposed constitution and see what it would do to you as individuals.

This morning I learned a very good objective lesson on the value of time and on the value of money. Time is of no essence in this thing if we can do it right. Let us take ten years and certainly if it is going to be fool-proof, it surely is going to require repeated amendments. Let us amend the old constitution step by step.

I would refer you specifically to Article IV of the proposed constitution, Section 4, heading of "Funds, Property, Dues, Assessments and Expenditures." This section provides means by which C.M.A. may raise funds. It provides that the house of delegates may levy special assessments in addition to the regular dues upon membership of the C.M.A. It provides also that the house of delegates may levy penalties upon members and even assessments. It also provides penalties for failure to pay the assessment or surrender of membership in the association or component society or both.

I come here tonight as a representative of my society and my society is very jealous of its rights and prerogatives. I am very certain that my society would not agree to me, as their representative, in this house of delegates, giving you the right to suspend membership in the local society. Suspension of membership in the local society is a very serious proposition. I am certain that we on the local level are much better qualified to determine qualifications of membership than you in this house and I fear that in the future, if you adopt this constitution that you may use this right very poorly and very arbitrarily.

There is the danger in this proposed constitution that your rights as a member in the local society can be abrogated for other things because it has been the history of people down through the ages that, regardless of what the motives have been, the attending powers have always wanted more power and they have taken it. That is the reason why in our own national Constitution in the Convention of 1789, regardless of the time it took to adopt it, and regardless of the time it took to amend it, and constitutional conventions were held in various states, that Constitution was rejected and sent back and they said, "We will not take it until you provide us with specific and well written recommendations as a guarantee of our rights." That came to be known as the Bill of Rights upon which we base our own separate individual rights.

This proposed constitution in no way guarantees us the right of individual membership in the local society. Furthermore, if this house some time in the future sees fit to levy an assessment upon the membership, when the budget has been exceeded for some reason, I know of no better way in which this house can receive a vote of confidence than it can by a failure to accomplish the payment of that assessment. Certainly there could be no better vote of confidence of any action of this house than to take this action and I do not propose to be browbeaten in any way by voting "no" against any assessment of this house now and if I vote "no" upon an assessment of this house, the membership in my local society is in danger and thus my livelihood is in danger, so I hope that you will think long enough to reject this constitution in whole. (Applause.)

DR. REMMEN: I rise to a point of information. Is it not a fact that at the present time the constitution provides that membership in the national, state and county medical associations is inseparable and the loss of any one is a loss of all three?

VICE-SPEAKER CHARNOCK: As far as I know, that is not so, Dr. Remmen. It starts at the county level first.

Does anyone want to discuss this any further? Is there any more discussion?

DR. ROBERTSON WARD (San Francisco): As a member of the committee of five that brought this proposal to you, I want to admit fallibility. The argument has been made here tonight that certainly you should put your trust in the 20 men who have considered this thing over a period of years to a greater extent than you should put it in the committee, the reference committee, that has been appointed to serve for a month. As a member of the committee of the 20 people who have considered this over a period of two years, and as a member of

the committee of five that made the final draft, I would like to urge the rejection of the constitution because it is inadequate in my point of view. (Applause.)

VICE-SPEAKER CHARNOCK: Does anyone else want to discuss this?

. . . The question was called for. . . .

VICE-SPEAKER CHARNOCK: The question has been called for. We are going to vote on this constitution as a single instrument, the constitution as printed in CALIFORNIA MEDICINE for December and in the Reports Bulletin. Are you ready for the question?

A MEMBER: If you vote "no," do you reject it and if you vote "yes," do we reject it or what?

VICE-SPEAKER CHARNOCK: We are going to vote on the constitution itself and not on the report of the resolutions committee. I think if we vote for this either "yes" or "no," it will be much simpler for us to understand what we are voting for.

DR. MAGOON: This was presented to the house last year for decision tonight and you can't change it. It has got to be voted on as a constitution.

VICE-SPEAKER CHARNOCK: We are going to vote by ballot and I see no reason why we cannot vote either "yes" or "no" on the constitution itself and not on the recommendations of the resolutions committee. Are we all clear on that?

A MEMBER: Does "yes" mean you accept it and "no" you reject it?

VICE-SPEAKER CHARNOCK: Yes, that means we accept the new instrument if we vote "yes" and "no" means we reject it. Is everybody clear on that? Is the house willing to vote by ballot?

. . . There were cries of "yes." . . .

VICE-SPEAKER CHARNOCK: All right, we will appoint Dr. Bullis, Dr. Ward and Dr. Sam Randall as tellers.

DR. REMMEN: A point of order.

VICE-SPEAKER CHARNOCK: Do you want to state your point of order?

DR. REMMEN: We are voting on the new constitution and has the roll been called? Is there a quorum of the delegates present here?

VICE-SPEAKER CHARNOCK: The house was constituted at the outset when the report of the credentials committee was given. There was a quorum present and at the present time there is a quorum present. The only people who will vote will be the delegates. Will our legal counsel give us any advice on that?

MR. HASSARD: Mr. Speaker: The only persons who may vote are those who are seated as delegates and who reported as such to the credentials committee earlier this evening. For the information of the house may I point out that the vote, in order to adopt the new constitution, must be a two-thirds affirmative vote. That means when you cast your ballot "yes" you are voting in favor of the adoption of the constitution as was presented a year ago by Dr. McClendon and if you vote "no" you are voting for rejection of it.

A MEMBER: I question that the chair can accept that vote. I believe we have to call the roll and that the alternates for absent delegates must be seated.

VICE-SPEAKER CHARNOCK: A request has been made for a roll call. That is in order.

DR. REMMEN: In the interest of saving time, would I be in order in suggesting that the vote on this question be taken on Tuesday when the house has been polled?

VICE-SPEAKER CHARNOCK: I don't think you can do that. I think we have to vote on this tonight and have it either "yes" or "no." The roll will be called. Will the secretary of each delegation be prepared to put in an alternate in alphabetical order.

. . . The roll was called by the secretary, Dr. Garland. . . .

VICE-SPEAKER CHARNOCK: The tellers will please come forward, Dr. Bullis, Dr. Ward and Dr. Sam Randall. We will now vote on the ballots. Those who have been seated as delegates will have the right to vote accordingly and the ballots will be passed out.

. . . The ballots were then passed to the delegates. . . .

VICE-SPEAKER CHARNOCK: While they are passing the ballots and while they are voting upon them, we will state again that you will vote "yes" if you are in favor of the new constitution and "no" if you are opposed to it. While we are passing the ballots we will proceed with the next item of business which is new business, No. 19, the introduction of resolutions. Those who wish to present resolutions will come forward and state their name and their county and have their copies ready to be handed to the secretary.

Resolution No. 1

(Previously introduced as addendum to report of the council.)

DR. GERSON R. BISKIND (San Francisco): The San Francisco delegation has instructed me to introduce the following resolution. I will omit for brevity most of the "whereases." I will just read the "resolved."

. . . The complete resolution is as follows . . .

Resolution No. 2

WHEREAS, The closed panel system of distribution of workmen's compensation medical practice is alien to the principle of free choice of physicians and may result in unhealthy regimentation, and

WHEREAS, The California State Compensation Insurance Fund has had a modified open panel for more than ten years, and

WHEREAS, Certain private compensation insurance companies are experimenting with modified open panels, and,

WHEREAS, The medical profession of the State of California is exceedingly capable and able to give the best care to injured workmen on a modified open panel designed to give considerable choice of physicians, and

WHEREAS, Free choice of physicians fosters an improved patient-doctor relationship, an essential

often lacking in the rehabilitation of the injured workman when he is treated under the strict closed panel system; therefore, be it

Resolved, That the house of delegates of the California Medical Association approve the principle of an open panel in the practice of workmen's compensation cases; and be it further

Resolved, That the council of the California Medical Association be instructed to use all power within its means to foster the use of open panels in the practice of workmen's compensation insurance; and be it further

Resolved, That the council of the California Medical Association be instructed to set up a committee to study open panel compensation insurance practice with the view of working out some of the problems presented by the medical profession, insurance carriers, and/or self-insured employers, and organized labor.

DR. MAGOON: May I rise to a point of order?

VICE-SPEAKER CHARNOCK: State your point of order.

DR. MAGOON: It is 12:00 o'clock. There is a tremendous volume of resolutions to be introduced. Would it be in order, since the resolutions are to be published and presented to the reference committee, to present them to this house by title only?

VICE-SPEAKER CHARNOCK: If the house wishes, that may be done. What is the wish of the house? Those who wish the resolutions to be presented by title only and not read will indicate by saying "aye" and those who wish to have them read will say "no."

. . . A vote was taken on the suggestion and the majority voted "aye." . . .

VICE-SPEAKER CHARNOCK: The motion wins and they will be presented by title.

DR. BISKIND: Most of these resolutions are not formally titled but I will try to describe them.

. . . Dr. Biskind presented the following resolutions . . .

Resolution No. 3

Resolved, That as a statement of policy the California Society of Pathologists is opposed to the centralization of facilities for the initial diagnosis of malignant disease by means of examinations of tissues, exudates or bodily excretions by whatever name the procedure might be called. This is specifically meant to include any exfoliative cytologic diagnostic procedure proposed as a part of any mass survey conducted by federal, state or municipal government or political subdivision thereof or by any private organization sponsored or supported by such governmental agency or by endowments or public voluntary contributions: and be it further

Resolved, That exfoliative cytologic examinations incident to mass surveys be done at the local level by pathologists licensed to practice medicine in California. Should the local pathologist desire consultation, in accordance with the usual custom he may refer the material to any pathologist of his choice.

Resolution No. 4

WHEREAS, The subject of industrial accident fees is of considerable interest to all members of the California Medical Association, and

WHEREAS, Every member should have an opportunity to study and to voice his approval of any fee schedule which he is required to support; be it therefore

Resolved, That any future proposed fee schedule be placed before the component county medical societies and all interested and recognized specialty associations for their study, comment and approval at least sixty days prior to submission to the Industrial Accident Commission for its final action.

Resolution No. 5

WHEREAS, The physicians of California have been experimenting in the distribution of the cost of medical care through California Physicians' Service for more than ten years, and

WHEREAS, The California Physicians' Service has never paid 100 per cent on its fee schedule, and,

WHEREAS, It is the duty of the California Medical Association to point out to the public the real cost of standard medical care, and

WHEREAS, It is unwise for the profession to be engaging voluntarily in any business practices on a small scale that would be dangerous or impossible if the same were put into universal practice or brought under Government control; now, therefore, be it

Resolved, That the house of delegates of the California Medical Association request the board of trustees of the California Physicians' Service immediately to make it a policy that all new and renewed contracts written shall have sufficient premium to fulfill actuarial requirements to pay 100 per cent on the fee schedule.

Resolution No. 6

WHEREAS, The present practice in force in California Physicians' Service provides for the payment of professional members at a rate representing less than that of its present established fee schedule, roughly 80 per cent; and

WHEREAS, This aforementioned fee schedule, even though paid in full, is insufficient to reimburse its professional members for operating expenses and a reasonable profit; and

WHEREAS, California Physicians' Service has now announced that it is embarking on a new venture, a catastrophic illness plan to cover 23 chronic illnesses; and

WHEREAS, This new coverage is to be paid from funds separately assessed for this specific coverage; now, therefore, be it

Resolved, That the council of the California Medical Association be instructed by this body to demand that the premium for this new coverage be set at a level which will insure that professional members be reimbursed at a rate representing 100 per cent of the established fee schedule.

Resolution No. 7

WHEREAS, The subject of medical service and hospital service corporations is of vital interest to the people of California, especially the medical profession; now, therefore, be it

Resolved, That the house of delegates of the California Medical Association instruct the council of the California Medical Association to make a thorough study of all possible government regulations of hospital service and medical service corporations, open panel, closed panel, mutual, non-profit, and profit, so that any time legislative action in this field is imminent a program to defend the rights of the people of California and good medicine will be at hand and some emergency expediency will not have to be used.

Resolution No. 8

WHEREAS, There are many indemnifying insurance policies for medical and surgical benefits in the State of California, and

WHEREAS, Indemnifying insurance for medical costs does not regiment practice and offers free choice of physicians, and

WHEREAS, Indemnifying insurance does not fix medical fees, but leaves that to the physician and patients, and,

WHEREAS, Medical guidance is being sought in the field of indemnifying schedules for medical costs; now, therefore, be it

Resolved, That the house of delegates of the California Medical Association approve voluntary indemnifying insurance as a sound and excellent method of distributing medical and surgical costs; and, be it further

Resolved, That the council of the California Medical Association be instructed to inform, and/or advertise to the public that the California Medical Association approves the indemnifying insurance as a method of providing the cost of medical and hospital expense; and, be it further

Resolved, That the council of the California Medical Association be instructed to institute a thorough study of indemnifying insurance for the purpose of pointing out abuses that can be eliminated by the medical profession and the insurance carriers.

Resolution No. 9

WHEREAS, Under reorganization of the armed forces, it is proposed to give medical care to some 400,000 civilian employees of the armed forces, and

WHEREAS, Military medicine should be limited to care of military personnel in line with the need of the military to maintain tactical mobility; now, therefore, be it

Resolved, That California Medical Association so direct its forces that the medical care of these civilians be retained in private practitioners' hands and that the armed forces not be permitted to expand their medical services to furnish medical care for these civilians; and, be it further

Resolved, That the California Medical Association carry this resolution to the American Medical Association in San Francisco in June for consideration and action on a national level.

Resolution No. 10

WHEREAS, The California Medical Association's fee schedules are in a state of instability by reason of division of authority between the Industrial Fee Schedule Committee and the C.P.S. Fee Schedule Committee, and special advisory and negotiating committees, and

WHEREAS, The present arrangement also results in needless duplication of effort and expense, and

WHEREAS, Two conflicting schedules exist as a result of such duplication, and

WHEREAS, There is a strong tendency for either of these schedules to be interpreted as a standard of average private fees in California; now, therefore, be it

Resolved, That the present Industrial Accident Fee Schedule Committee and the C.P.S. Fee Schedule Committee be abolished and replaced by a single C.M.A. Fee Schedule Committee, as representative as possible of general practice and the specialties, with sub-committees as necessary, members to be appointed for a three-year term, initially on a staggered basis for continuity of personnel; and, be it further

Resolved, That this committee be instructed to prepare, and maintain by revision as required, a schedule of average fees in California without any minimum or maximum implication; and, be it further

Resolved, That any reduction in the schedule, for instance to C.P.S. and to industrial accident insurance carriers, shall be granted with implication; and, be it further

Resolved, That any reduction in the schedule, for instance to C.P.S. and to industrial accident insurance carriers, shall be granted with emphasis on the fact that such reduction is a concession on the part of our members; and, be it further

Resolved, That this committee shall report to the house of delegates at its annual meeting and any interim meeting.

VICE-SPEAKER CHARNOCK: These resolutions will be submitted to Reference Committee No. 3.

Do we have any more?

DR. FRANK F. SCHADE (Los Angeles): This resolution requests the Governor of the State of California to appoint a physician to membership in the California State Disaster Council.

Resolution No. 11

WHEREAS, Increasing importance is being given to civilian defense, and

WHEREAS, In the event of a major disaster, the care of the sick and injured will be one of the major problems of civilian defense, and

WHEREAS, The California State Disaster Council contains representatives of police and fire officials, representatives of city government and the American Red Cross but no representative of the medical profession; now, therefore, be it

Resolved, That the Governor of the State of California be respectfully petitioned to appoint a physician to the California State Disaster Council, said physician to be a member of the California Medical Association and preferably one who is conversant with the problems of civilian medical defense.

VICE-SPEAKER CHARNOCK: This will be referred to Reference Committee No. 3.

DR. MILLER: This is a resolution regarding the Benevolence Fund.

Resolution No. 12

WHEREAS, Several years ago a benevolence fund was created by the state association for the worthy purpose of aiding aged and infirm members not able to provide for themselves, and

WHEREAS, One dollar of the state's dues was ordered assigned to this purpose, and

WHEREAS, An increasing number of retired physicians are tending to settle in one of our component counties to the detriment of funds for regular members in that county, and

WHEREAS, The enormous growth of our association may involve a program of tremendous scope, requiring many times one dollar from each and every member, and

WHEREAS, The welfare philosophy of federal aid to states and state aid to counties cannot be projected indefinitely, and

WHEREAS, Most physicians believe that the responsibility of the care of the aged is one best discharged at county level by persons close to the recipient; now, therefore, be it

Resolved, 1. That the benevolence program at state level be discontinued as of January 1, 1951; and, be it further

Resolved, 2. That each and every county society in this state be advised to create suitable funds at county level for the care of disabled or infirm needy physicians; and, be it further

Resolved, 3. That if such physicians wish to move to other counties in their later lives, that the county of their origin may, if funds permit, defray the cost of care in the new county, if the latter has suitable facilities.

VICE-SPEAKER CHARNOCK: This resolution on the benevolent fund will be referred to Reference Committee No. 3.

A MEMBER: Could we have a ruling as to what constitutes a title? Could we have some slight idea what the resolution is about, just merely a short sentence or so.

VICE-SPEAKER CHARNOCK: Yes, just give us a short sentence or so, so we will know what it is all about. Dr. Cook.

DR. ORRIN COOK (Sacramento): This resolution is to the effect that the radio program, "California Caravan," under the sponsorship of the California Medical Association, be discontinued.

Resolution No. 13

Resolved, That the 1950-51 annual budget be revised to the effect that the provision of funds for the radio program "California Caravan" be deleted and that this radio program, under the sponsorship of the California Medical Association, be discontinued.

VICE-SPEAKER CHARNOCK: This will be referred to Reference Committee No. 3.

Next!

DR. LEON P. FOX (Santa Clara County): This resolution is concerning the establishment of an annual fund of $20,000 to be used by the California Medical Association for public relations.

Resolution No. 14

WHEREAS, There is continually an obvious necessity and imperative need for a strong county medical society local level public relations program in the state, and

WHEREAS, Past experience has repeatedly and forcefully demonstrated that grass roots public relations programs have frequently originated at the level of county medical societies, and

WHEREAS, Such programs have proven to be of such merit as to be adopted on nationwide levels, and

WHEREAS, Such programs are often best introduced as a pilot project for evaluation and trial on a local level, and

WHEREAS, Certain county medical societies which have displayed unusual initiative urgently need financial assistance; be it therefore

Resolved, That the California Medical Association shall establish an annual fund of $20,000 to be used at the county medical society level for those projects in public relations which are approved by the council of the California Medical Association.

VICE-SPEAKER CHARNOCK: It will be referred to Reference Committee No. 2. It has to do with finances.

The next resolution.

DR. H. B. BREITMAN (Los Angeles): This is a proposed amendment to the constitution, article VII, section 1, to be changed to read that delegates or councilors-at-large which are assigned to specific counties by reason of their size shall be elected by delegates from such specified counties.

Proposed Constitutional Amendment

Be It Resolved, That Article VII, Section 1, of the constitution of the California Medical Association be amended to read as follows:

"ARTICLE VII, COUNCIL AND EXECUTIVE COMMITTEE

"Section 1—The Council

"The Council shall consist of the Councilors and ex officio: The President, the President-Elect, and the Speaker of the House of Delegates, each with all the rights of a Councilor.

"Subject to the provisions herein, the Secretary-Treasurer and the Editor shall also be ex officio members of the Council, but without the right to vote.

"The nine district Councilors shall be elected as follows:

"In the interim between the first and second meetings of the House of Delegates at any annual session, the delegates from each Councilor district for which a councilorship is about to become vacant shall meet and elect a Councilor from that district. In the event that a majority of the delegates from any district are unable to agree upon a Councilor, the House of Delegates at its second meeting, shall elect a Councilor from that district. Those councilorships-at-large which are assigned to specified counties by reason of the size of their membership shall in similar manner be elected by the delegates from such specified counties. All nominees for councilorships must be members in good standing.

"Unassigned Councilors-at-Large shall be elected by the House of Delegates. Not more than two Councilors-at-Large shall be elected from any one Councilor district; provided, however, that when any one Councilor district shall consist of a component county society having 1,500 or more members, two of the Councilors-at-Large shall be elected from its membership.

"Any chapters, sections or paragraphs of the Constitution or By-Laws which are in conflict with this amendment are hereby repealed."

VICE-SPEAKER CHARNOCK: That will lie on the table.

DR. BURT DAVIS (Santa Clara): I think the simplest way is to just read the "resolved" portion.

Resolution No. 15

WHEREAS, The public relations program of the California Medical Association was initiated under pressure which required contacting the general public as rapidly as possible, and

WHEREAS, This program has proven effective in publicizing voluntary health insurance, and

WHEREAS, This program, though necessary at the beginning, has been expensive, and

WHEREAS, The general public is now aware of the existence of voluntary health insurance, and

WHEREAS, The radio program "California Caravan" has met the need for which it was designed, but is no longer a necessary nor a justifiable expenditure of the association funds, and

WHEREAS, More efficient techniques for approaching the public at a lesser unit cost per contact are available; now, therefore, be it

Resolved, That the radio program "California Caravan" be discontinued.

The second resolution:

Resolution No. 16

WHEREAS, The 1949 house of delegates encouraged the contact with students of medicine during their training and,

WHEREAS, One of the methods by which this was done was the publication of the pamphlet entitled *Future*, and

WHEREAS, Medical students are more desirous of scientific knowledge than of political knowledge, and better contact may be made by scientific instruction than by political pamphlets; now, therefore, be it

Resolved, That the house of delegates of the California Medical Association suggests to the managerial board of CALIFORNIA MEDICINE that the prepayment of subscriptions to CALIFORNIA MEDICINE for all medical students, interns and residents within California would have many worthwhile benefits in relations with students of medicine; and, be it further

Resolved, That the managerial board be requested to contact agencies whose cooperation might well be enlisted to attain this effect.

The third resolution:

Resolution No. 17

WHEREAS, There has been a growing tendency for organizations with medical administrations to enter upon the field of the practice of medicine, and to make decisions which properly should be made by licensed physicians and surgeons, and

WHEREAS, The business and professions code of the State of California limits the privilege of professional practice of medicine and surgery to natural persons so licensed, and

WHEREAS, This dangerous encroachment upon the practice of medicine and surgery is becoming more evident in the case of hospital administration where the rights and privileges of practicing physicians are being usurped by the administrative bodies, namely, in the invasion of the fields of radiology, pathology, anesthesiology, to name but a few, and

WHEREAS, The rights of hospital staff members are being curtailed by empirical formulation of procedural rules, standing orders, and arbitrary restrictions upon the activities of physicians whose licenses from the State of California are identical and should have an equal weight; now, therefore, be it

Resolved, That a copy of this resolution be sent to each hospital administrator within the state of California.

VICE-SPEAKER CHARNOCK: These will be referred to Reference Committee No. 3.

Dr. J. M. de los Reyes.

DR. J. M. DE LOS REYES (Los Angeles): I have two amendments to the new or the old constitution, gentlemen. The first one will refer to the qualifying of members so that they can be elected to the house of delegates.

The second one is on the oath of office for officers of the association.

. . . The second resolution introduced by Dr. de los Reyes reads as follows . . .

Resolution No. 18

Resolved, That Section 9 is hereby added to Chapter VI of the by-laws of this association, California Medical Association, to read as follows:

"Section 9—Oath of Office

"All officers of this association, upon election or appointment, shall subscribe to an oath or affirma-

tion as follows: "I do not belong and have not belonged to any organization advocating the overthrow or change of the form of government of the U.S.A. by violent or unlawful means nor do I believe in changing the form of government of the U.S.A. by violent or unlawful means."

. . . The first resolution referred to by Dr. de los Reyes appears below as Resolution No. 24. . . .

VICE-SPEAKER CHARNOCK: These will lie on the table.

Do we have any more resolutions?

Dr. Bailey.

DR. WILBUR BAILEY (Los Angeles): This is a resolution asking for a means of recognition of ethical psychologists.

Resolution No. 19

WHEREAS, Properly trained psychologists with high ethical standards who work under the guidance of doctors of medicine render a genuine public service, but

WHEREAS, There are a host of other individuals partly or completely untrained who pose as psychologists, and

WHEREAS, The action of some of these individuals is very much against the public welfare (For example one partly-trained psychologist by way of preventing what he termed a "financial barrier" between him and his patient, borrowed all her money, thus reducing her numerous difficulties to a single package—the problem of getting her money back. Another example is that of a group of women who formerly operated as an escort bureau in one large southern California city, but who have recently paid the city license fee of $12 and registered as psychologists), although the scope of private enterprise has doubtless thus been broadened, it is debatable whether this action is for the general public good, and

WHEREAS, State licensing might seem a ready answer to stopping these "mind meddlers" whose talents range from bunco to blackmail, licensing has two big disadvantages: (1) Nearly anyone who has worked as a so-called psychologist for three to five years would have to be "blanketed in" under a so-called "grandfather" clause; (2) Licensing boards and laws do not always turn out as originally intended; now, therefore, be it

Resolved, That the C.M.A. and the component county societies follow a pattern already successfully established with other affiliated and ancillary groups and set up required standards of education and appropriate codes of ethics for psychologists who work under the direction of the medical profession; and, be it further

Resolved, That a list of such recognized psychologists be made available for the use of the medical profession and the public.

VICE-SPEAKER CHARNOCK: This will be sent to Reference Committee No. 3.

DR. SIDNEY J. THOMAS (Santa Clara): This resolution deals with the attempt of hospital administrators to coerce physicians by using their restrictive beds for making them send patients to the hospitals:

Resolution No. 20

WHEREAS, The C.M.A. continually strives to encourage the highest standards of medical practice, and

WHEREAS, The association believes that free choice of physician is an essential part of the maintenance of such standards, and

WHEREAS, The association is informed that a few hospital administrators are attempting to restrict such choice by requiring that staff members and other physicians desiring to hospitalize patients in such hospitals, direct all private ambulatory outpatients into the departments of those hospitals (for diagnosis, treatment, drugs and other services), and

WHEREAS, The Northern California Retail Druggist Association has already approached officers of the A.M.A. with a request for aid in the termination of such coercive practices; now, therefore, be it

Resolved, That the house of delegates of the C.M.A. deplores such alleged practices on the part of hospitals or hospital administrators; and, be it further

Resolved, That all members of the association be urged to refer their patients to sources based on the highest quality, and who conduct their institutions primarily for the care of those sick and injured in need of bed care; and, be it further

Resolved, That the house direct the executive secretary of the association to transmit copies of this resolution to the grievance committees of the county medical societies in this state, and to the officers of the Association of California Hospitals.

VICE-SPEAKER CHARNOCK: This will be referred to Reference Committee No. 3.

DR. THOMAS N. FOSTER (Santa Clara County): This is a resolution asking that the funds budgeted for public relations be maintained as they were last year.

Resolution No. 21

WHEREAS, The public relations program of the medical profession has fully justified the expense and effort involved; and

WHEREAS, The hazard of political interference in the practice of medicine still exists despite temporary remission of intensity, and

WHEREAS, It is most urgent that the medical profession not be lulled into complacent false security, and

WHEREAS, An unanticipated shift of public opinion might suddenly occur in the event of a national economic depression; be it therefore

Resolved, That the California Medical Association maintain funds budgeted for their public service program at the same level as that of the previous fiscal year.

VICE-SPEAKER CHARNOCK: This will be referred to Reference Committee No. 3.

Dr. J. B. Josephson (Santa Clara County): This is a resolution concerning the reorganization of public relations in the California Medical Association.

Resolution No. 22

Whereas, Organized medicine in general and California medicine in particular recognize the profound value of public relations, and

Whereas, C.M.A. has seen fit to establish an office of executive secretary whose originally intended duty was to initiate and direct the public relations and to streamline the business administration, and

Whereas, C.M.A. has seen fit yearly to budget some one hundred thousands of dollars for the sole purpose of improving public relations, almost all of which has been expended on a radio program, thought by many to be immensely costly in proportion to value returned, and

Whereas, Such a program of and by itself does not constitute an adequate and well-rounded solution of the problem since it so inadequately expounds the general principles of public relations, and

Whereas, The admistrative duties of the executive secretary have been so well organized and delegated to subordinates as to no longer occupy his full time and capacity; now, therefore, be it

Resolved, That the house of delegates of the C.M.A. instructs its council to direct the executive secretary to henceforth give the problem of public relations his major interest, concern and attention, and allow his innative imaginative and creative abilities to conceive, gestate and deliver to California medicine a plan for organized and directive public relations embodying the following: (1) A director of public relations selected from the present secretarial staff or procured from afar whose duties shall be solely public relations, (2) Formulate, execute and direct public relations at the state level, and (3) Advise and assist and cooperate at the county level with help and direction to the county executive secretaries and society officers; and, be it further

Resolved, That the house of delegates of the C.M.A. instruct its council to curtail, reduce or alter its present expenditures on public relations, so as to give necessary financial aid to counties carrying on such a program.

Vice-Speaker Charnock: This goes to Reference Committee No. 3.

Do we have any more resolutions?

Dr. Walter Wessels (Los Angeles): This pertains to a recommendation of the delegates to the American Medical Association for a plea for unification of the inspection of the American College of Surgeons and the A.M.A. and the committees that inspect the hospitals for the training of residents. (Applause.)

Resolution No. 23

At the meeting of the house of delegates in San Diego, Dr. Alson Kilgore has been delegated by a group of hospital staffs in the San Francisco Bay Area to present a resolution with reference to approval for residency programs. The situation at the present time is as follows:

1. The American College of Surgeons has an inspection service and rates certain hospitals for residency programs.

2. The American Medical Association, through the various boards, also has an inspection and rating program for residencies.

3. These programs, as now constituted, do not coordinate, and the American College of Surgeons, for instance, may approve certain hospitals for a three-year residency program in surgery or the surgical specialties. The A.M.A. might come along and with the same hospital not list it for approval or list other hospitals for approval for residencies, for instance, that the American College of Surgeons has not listed.

The resolution which Dr. Kilgore will present will probably cover these three points:

1. That a unified, integrated inspection service should be established with regard to hospital inspection and graduate training programs; in addition, representation should be made concerning the record room system set-up, which has become burdensome, expensive, and unnecessary, as a result of the dual inspection we are now working under.

2. That the rigid 100 per cent specialty practice requirement for diplomates of American boards be relaxed.

3. That these matters be placed before the C.M.A. house of delegates by resolution for transferral to the A.M.A.

[Note: The resolution mentioned was prepared by Reference Committee No. 3 and appears as a part of the report of that committee.]

Vice-Speaker Charnock: That will be referred to Reference Committee No. 3.

Next, have we any more? Do we have any more resolutions? We now have 23 resolutions.

Resolution No. 24

(*By* J. M. de los Reyes, Los Angeles. See Resolution No. 18).

Resolved, That Subdivision (d) of Section 6 of Chapter III of the by-laws of this association, California Medical Association, is hereby amended by adding to said sub-section (b) at the end thereof a new paragraph reading as follows:

The Committee on Credentials shall require each delegate and alternate and other active member of a component county society who desires to be seated as a member of the House of Delegates, to subscribe under oath and in such form as shall be determined by the Credentials Committee, that he is not and has not been at any time a member of any organization listed, published or held to be subversive by the Department of Justice of the United States of America. In the event of refusal to subscribe to such oath, the Credentials Committee shall not include such person in its written report to the House of Delegates designating the delegates and alternates entitled to membership therein.

. . . The resolution was referred to Reference Committee No. 3. . . .

VICE-SPEAKER CHARNOCK: While we are waiting for the tellers, we have several announcements.

. . . Announcements. . . .

DR. J. LAFE LUDWIG (Los Angeles): Mr. Speaker and members of the house of delegates: I have no resolution to offer at this time. I would like to offer a motion, and that is that a motion of thanks and all that goes with it be extended to the council of the California Medical Association for the fine job they have done for us the past year. Secondly, in case this new constitution does not pass, I would like to make a motion that the reference committee, I believe Committee No. 3, be held as the committeee to carry on their work on this particular program.

VICE-SPEAKER CHARNOCK: We will split that up into two motions. The first motion is that the council be thanked for the work which they have done.

. . . A vote was taken on the motion and it was unanimously carried. . . .

VICE-SPEAKER CHARNOCK: On the suggestion about Reference Committee No. 3, is there a second to that?

. . . The motion was variously seconded, put to a vote and carried. . . .

VICE-SPEAKER CHARNOCK: Dr. Randall, please announce the vote on the new constitution.

DR. RANDALL: "Yes," 56; "no," 158. (Applause.)

DR. LOOS: Mr. Speaker.

VICE-SPEAKER CHARNOCK: The chair will recognize Dr. Loos.

DR. LOOS: I wish to present an amendment to the formerly proposed constitution which has been voted down, to be laid on the table.

VICE-SPEAKER CHARNOCK: It will be laid on the table for one year.

Are there any more resolutions to come before the house? (No response.)

This constitutes the business which has been presented for this evening. A motion is in order to adjourn.

. . . It was moved, seconded and carried that the meeting adjourn. . . .

. . . The meeting adjourned at 12:10 a.m. . . .

HOUSE OF DELEGATES MEETING
MAY 2, 1950

The second meeting of the house of delegates 1950 annual session (47th annual session) was held in the Ball Room, Hotel del Coronado, Coronado, California, Tuesday, May 2, 1950. The meeting was called to order at 5:00 p.m. by the speaker of the house, L. A. Alesen, who presided.

SPEAKER ALESEN: Will the house please come to order?

The chair recognizes Dr. Wilcox, the chairman of the Committee on Credentials, who will give us a report on the members registered.

DR. WILCOX: Mr. Chairman, the house of delegates now has a quorum.

SPEAKER ALESEN: We shall proceed now to call the roll. Mr. Secretary.

. . . Roll call. . . .

SPEAKER ALESEN: The next item will be the secretary's announcement of the council's selection of the place for the 1951 session.

SECRETARY GARLAND: The council has selected the city of Los Angeles. (Applause.)

SPEAKER ALESEN: At this time the chair recognizes President R. Stanley Kneeshaw, who will make the presentation of the 50-year pins.

PRESIDENT KNEESHAW: The names of the men who have honorably served the California Medical Association for 50 years are:

Dr. Raymond G. Taylor of Los Angeles.
Dr. A. S. Parker of Merced.
Dr. Charles H. Bulson of Napa.
Dr. Frank Craw of Sacramento.
Dr. John Ballis of Arrowhead Lake.
Dr. H. O. Vonulie of San Francisco.
Dr. William J. Blevin, Sr., of Woodland.

I think there is only one of these gentlemen present. Will the secretary please escort Dr. A. S. Parker to the rostrum? (Applause.)

Dr. Parker, it is my privilege and my honor to present this pin to you for your 50 years of membership in the California Medical Association. I am sure that you have seen many changes in the many years that you have served the people here in California, and I hope that these changes have been for the best, both for the medical profession and for the people of California.

We want to thank you for coming so we could personally show you our esteem and give you this little bit of a token for your services here and in recognition of your having served the people of California these many years.

May you be with us for many, many more years and enjoy the good health that the people are getting from good medical care that is given by the free enterprise system. Thank you, Dr. Parker, for coming. (Applause.)

DR. PARKER: Mr. President and gentlemen: I thank you for the emblem. I am happy to have served the California Medical Association and the people of my community for 50 years. I believe that is all. Thank you.

PRESIDENT KNEESHAW: Thank you, Doctor. (Applause.)

SPEAKER ALESEN: By order of the council, Dr. Sidney Shipman, chairman of that body, will present a supplementary report to the house of delegates.

DR. SHIPMAN: Mr. Speaker, members of the house: The council is not without fault. Nobody realizes that better than the council itself. This morning in executive session the members of the council took the council apart and took themselves apart and arrived at a number of conclusions in which we thought you might be interested and also made some observations which we thought you should know about.

That, therefore, was included in a supplemental report which reads as follows:

1. The council is deeply concerned that maximum efficiency be expected and obtained from our business management. To this end a new firm of auditors has been engaged to audit the books of your association beginning with the next fiscal year. To secure an analysis of office procedures according to modern business methods, and to secure more efficient techniques and proper budgetary controls, the council has directed that the new firm of auditors conduct an over-all survey of the C.M.A. office, or, if they are not prepared to do this, that an independent firm of business analysts be secured for the purpose.

2. The council is concerned with the many standing committees of the association, some of which are largely inactive. Since these committees are provided for in the present constitution and by-laws, it suggests that any new constitution and by-laws be written with this fact in mind. In actual practice in recent years, special committees have been charged with specific duties from time to time, as an efficient method of dealing with certain problems as they arose.

3. The council is convinced that there is not sufficient liaison between members of the council, the house of delegates and the membership of the C.M.A. It recommends that renewed effort be devoted to a consideration of this matter by members of the council as well as members of the house.

4. In recent years it has been the practice to invite the growing number of county society executive secretaries to attend council meetings, not only for the purpose of acquainting them with the work done by the council for use in their component county societies, but also to avail ourselves of their valuable advice. Since great benefit accrues to the council from the presence of those gentlemen, we suggest that it might be proper to defray their expenses from C.M.A. funds, rather than have them borne by the various local societies.

I might say, for my own part, that during this current year the members of the council have been faithful in their attendance and they have worked hard. To those men I wish to extend my very sincere thanks. (Applause.)

SPEAKER ALESEN: The next item on the agenda is the election of officers. The chair will entertain nominations for the office of president-elect of the California Medical Association.

DR. BROWN (Alameda County): Mr. Speaker, members of the house of delegates: It is a very happy privilege for me to nominate for president-elect a friend of many years' standing and a fellow member of the Alameda County Medical Association. We in Alameda County are particularly proud of his achievements. He is an outstanding internist, chief of medical service at Highland Hospital and he has been an active and tireless worker for organized medicine, a past president of the Alameda County Medical Society, delegate to the A.M.A. for six years, and member of the council for the past four years.

For the past year he has been vice-chairman of the council and chairman on the executive committee. As president of the Blue Cross organization, Hospital Service of California, he has gained the knowledge and experience in the field of economics which has made his work to the council and to the state association particularly valuable.

Now as to his personal integrity I can assure you without hesitation that he has never been fingerprinted except voluntarily.

It is, therefore, with great pride and pleasure that I place in nomination for the position of president-elect of the California Medical Association the name of H. Gordon MacLean. (Applause.)

SPEAKER ALESEN: The name of H. Gordon MacLean has been placed in nomination for the office of president-elect. Are there other nominations?

If the chair hears no other nominations, the nominations will be closed. There appearing to be no further nominations, the chair declares the nominations closed.

How do you wish to vote?

. . . There were cries of "By acclamation." . . .

SPEAKER ALESEN: All those in favor of Dr. H. Gordon MacLean as president-elect, signify by saying "aye."

. . . The motion was put to a vote and it was unanimously carried.

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Will the vice-speaker please take the chair?

VICE-SPEAKER CHARNOCK: The next order of business is the nomination of a speaker for the house of delegates.

DR. CRANE: I wish to nominate L. A. Alesen to succeed himself as speaker of the house of delegates. Dr. Alesen needs no further introduction. (Applause.)

VICE-SPEAKER CHARNOCK: The name of Dr. Alesen has been placed in nomination. Are there any other nominations?

The chair, hearing none, declares the nominations closed.

How will you vote?

. . . There were cries of "By acclamation." . . .

VICE-SPEAKER CHARNOCK: All those in favor of Dr. Alesen will signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

VICE-SPEAKER CHARNOCK: Will the secretary please cast the ballot for Dr. Alesen?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

VICE-SPEAKER CHARNOCK: Dr. Alesen is elected.

SPEAKER ALESEN: Thank you. The best I can do to show my appreciation is to talk as fast and quickly as I can and say little.

The next office before you is that of vice-speaker of the house of delegates. Nominations are now in order.

DR. CRAIG (Pasadena): Mr. Speaker, members of the house of delegates: I would like to place in nomination for this office a man whose personality, ability and experience have spoken for themselves. I nominate to succeed himself Dr. Donald Charnock. (Applause.)

SPEAKER ALESEN: The name of Dr. Charnock has been placed in nomination to succeed himself as vice-speaker. Are there any other nominations? Hearing no other nominations, the chair declares the nominations closed.

How will you vote?

. . . There were cries of "By acclamation." . . .

SPEAKER ALESEN: All those in favor of Dr. Donald Charnock as vice-speaker signify by saying "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: Dr. Charnock is declared elected. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Thank you, sir.

The next item of business is the office of district councilors.

First, John D. Ball, Santa Ana.

Mr. Secretary, do you have nominations from the First District?

SECRETARY GARLAND: Mr. Speaker, it is my recollection that a nomination was handed up to the desk yesterday.

I apologize. It is not available here at the moment. Would the person who handed me that nomination please stand up?

Dr. Rees, you handed me a nomination with the name of Dr. John Ball on it?

DR. REES: That is correct.

SECRETARY GARLAND: Mr. Speaker, Dr. John Ball has been nominated.

SPEAKER ALESEN: Dr. John Ball has been nominated. Are there other nominations from the district?

How will you vote?

. . . There were cries of "By acclamation."

SPEAKER ALESEN: There appearing to be no further nominations, the chair declares nominations closed. All those in favor of Dr. John D. Ball signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: Dr. John D. Ball is elected. Mr. Secretary, will you please cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast. (Applause.)

SPEAKER ALESEN: The next item of business is the election of a councilor from the Fourth District. Dr. Axcel E. Anderson's term is expiring.

DR. E. C. HALLEY (Fresno delegation): Mr. Speaker, I wish to memorialize our district councilor. Mr. Speaker, members of the house of delegates: Dr. A. E. Anderson of Fresno, having served continuously as councilor from the Fourth District for the past 15 years, has requested that a younger councilor be elected here tonight to represent his district. Dr. Anderson has served ably and well on the council and has faithfully represented his district in the California Medical Association.

The Fourth District is justifiably proud of his record and accepts his decision with regret.

Mr. Speaker, I move that the house of delegates take due cognizance of Dr. Anderson's splendid service to the California Medical Association and that thanks and appreciation be conveyed in a letter to Dr. Anderson. (Applause.)

A MEMBER: I second the motion.

SPEAKER ALESEN: It is moved and seconded that the sense of Dr. Halley's communication be implemented by the central office. Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Now the nominations, Mr. Secretary, for councilor from the fourth district.

SECRETARY GARLAND: Mr. Speaker, we have the nomination of Dr. Neil Dau of Fresno.

SPEAKER ALESEN: Are there other nominations from this district? If not, the nominations are declared closed.

How will you vote?

. . . There were cries of "By acclamation." . . .

SPEAKER ALESEN: All those in favor of Dr. Neil Dau from Fresno County for councilor of the fourth district, please signify by the usual sign.

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Next is councilor of the seventh district, Donald D. Lum, Alameda, term expiring. Mr. Secretary, the nominations?

SECRETARY GARLAND: Mr. Speaker, we have received 18 valuable autographs, all nominating Dr. Donald Lum to succeed himself.

SPEAKER ALESEN: Are there other nominations for this position from the seventh district? There appearing none, the chair declares the nominations closed.

How will you vote?

. . . There were cries of "By acclamation." . . .

SPEAKER ALESEN: All in favor of selecting Dr. Donald Lum as councilor from the seventh district signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast. (Applause.)

SPEAKER ALESEN: The next item is that there are two councilors-at-large whose terms are expiring. First is Dr. Sidney J. Shipman. Nominations are in order for this position.

DR. GERSON R. BISKIND (San Francisco): Mr. Speaker, the San Francisco delegation has instructed me to place the name of Dr. Sidney Shipman in nomination to succeed himself. (Applause.)

SPEAKER ALESEN: The name of Dr. Sidney Shipman has been placed in nomination to succed himself as councilor-at-large. Are there other nominations? There appearing to be none, the chair declares the nominations closed.

All those in favor of electing Dr. Sidney Shipman to succeed himself signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: Dr. Shipman is declared elected. (Applause.)

Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Next is that of Dr. Wilbur Bailey, term expiring. Nominations are in order.

DR. J. P. SAMPSON (Los Angeles): Mr. Chairman and members of the house of delegates: I should like to place in nomination the name of Wilbur Bailey to succeed himself. (Applause.)

SPEAKER ALESEN: The name of Dr. Wilbur Bailey has been placed in nomination to succeed himself. Are there other nominations from the floor? If not, the nominations are declared closed.

All those in favor of Dr. Wilbur Bailey to succeed himself signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you please cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Next is that of Dr. Francis E. West to fill a vacancy in a term expiring 1951. Nominations are in order.

DR. J. B. PRICE (Orange County): Mr. Speaker, members of the house of delegates: I should like to place in nomination the name of Dr. Francis E. West to fill the unexpired term which he has so capably filled this past year. (Applause.)

SPEAKER ALESEN: The name of Dr. Francis E. West has been placed in nomination to succeed himself. Are there other nominations for this post? If not, all those in favor of electing Dr. Francis West signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Mr. Hunton reminds me we have another councilor-at-large to elect in lieu of the post now held by Dr. H. Gordon MacLean who has been selected as your president-elect. This is the term expiring in 1951.

Nominations are in order for this position.

DR. REYNOLDS: Mr. Speaker and members of the house of delegates: This is one of the functions at this convention that gives me particular pleasure and that is to place in nomination before you the name of a valued and esteemed friend, Dr. Ivan Heron of San Francisco, who is well known to most of you.

Dr. Heron is a graduate of Stanford University. That's bad, but we will forgive that. He has been the past president of the San Francisco County Medical Society; he has been the past president of the California Academy of General Practice. He is at present chairman of the section on general practice at this convention, and he is a fine gentleman. (Applause.)

SPEAKER ALESEN: The name of Dr. Ivan Heron has been placed in nomination to fulfill the unexpired term of Dr. H. Gordon MacLean as councilor-at-large. Are there further nominations? Hearing none, the chair declares the nominations closed.

All those in favor of electing Dr. Heron signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next item on the agenda is that of the selection of delegates to the A.M.A. for terms January 1, 1951, to December 31, 1952. The term of H. Gordon MacLean expires. Nominations are in order.

DR. MACDONALD: Mr. Speaker, house of delegates: It has been my honor to be selected by the Alameda County delegation to place in nomination the name of H. Gordon MacLean to succeed himself. (Applause.)

SPEAKER ALESEN: The name of Dr. H. Gordon MacLean has been placed in nomination to succeed himself as delegate to the A.M.A. Are there any other nominations? Hearing none, the chair declares the nominations closed. All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next gentlemen whose term expires is Dr. E. Vincent Askey. Nominations are now in order.

DR. J. LAFE LUDWIG (Los Angeles): Mr. Speaker, it gives me a great amount of pleasure, and I consider it a great honor to nominate Dr. E. Vincent Askey to succeed himself as delegate to the A.M.A. (Applause.)

SPEAKER ALESEN: The name of Dr. E. Vincent Askey has been placed in nomination to succeed himself as delegate to the A.M.A. Are there other nominations? Hearing none, the chair declares the nominations closed. All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: It is so ordered. Dr. Askey is elected. Mr. Secretary, will you cast the ballot, please?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Next is Dr. John W. Cline, term expiring.

DR. WARD (San Francisco): Mr. Speaker and members of the house of delegates: I have a little change in routine for you tonight. I have been delegated by the San Francisco delegation to place in nomination for the member of the house of delegates of the American Medical Association for the term expiring of John W. Cline, not John W. Cline but Dwight Wilbur. It gives me great pleasure to present Dr. Wilbur's name in nomination because a few years ago when he was in the service I was honored by being given the nomination and elected to the delegation to take his place. I am sure that the house of delegates of the A.M.A. will be glad to see Dr. Dwight Wilbur back in there pitching again the way he was before the war.

I guess I don't need to explain to you that we expect John Cline will not be available as a delegate to the house of the A.M.A. in 1951, 1952. (Applause.)

SPEAKER ALESEN: The name of Dr. Dwight Wilbur has been placed in nomination to succeed the post now held by Dr. John W. Cline who has been called higher. Are there other nominations for this post? If not, the chair declares the nominations closed.

All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next gentleman whose term expires is Dr. Donald Cass. Nominations are in order.

DR. J. NORMAN O'NEILL (Los Angeles): Mr. Speaker, members of the house of delegates: This is a fine looking group of men and women. I am sure that most of this august body feel the same as I do about the nominee whose name I am going to present. I think that the man in whom this group has the trust and confidence to nominate to that high office of president of the California Medical Association certainly deserves to go back to the American Medical Association, and without further ado it gives me great pleasure to place in nomination the name of Dr. Donald Cass to succeed himself as delegate to the American Medical Association. (Applause.)

SPEAKER ALESEN: The name of Dr. Donald Cass has been placed in nomination to succeed himself as delegate to the American Medical Association. Are there other nominations? If not, the chair declares the nominations closed.

All those in favor of Dr. Cass signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next gentleman whose term expires is Dr. Ralph B. Eusden. Nominations are in order.

DR. JOHN BALL (Orange County): Mr. Speaker, and members of the house of delegates: It is my pleasure and privilege to place in nomination the name of Dr. Ralph Eusden to succeed himself. I have been requested by his own society to do this and although Santa Ana is not in Los Angeles County, we consider ourselves a suburb of Long Beach. It is my pleasure to nominate Dr. Ralph B. Eusden. (Applause.)

DR. DIEPENBROCK (San Francisco): Mr. Chairman, I would like to second the nomination of Dr. Eusden.

SPEAKER ALESEN: Are there other nominations for this post?

DR. REMMEN: May I also second the nomination of Dr. Eusden? It gives me tremendous pleasure to do that, but I think they have it wrong. I think Long Beach is a suburb of Santa Ana.

DR. BULLIS: Mr. Speaker, may I also second that nomination.

DR. PHILIP CUNNANE: Mr. Speaker, I have had a long and great affection for a fine gentleman: knowing him so long and recognizing his capacity, it is a privilege to second that motion.

SPEAKER ALESEN: Dr. Cunnane seconds the motion.

DR. DAU (Fresno County): Mr. Speaker, May I also second the nomination of Dr. Eusden.

A MEMBER: I move the nominations be closed.

SPEAKER ALESEN: Are there other nominations

for this post? Hearing none, the chair declares the nominations closed. All those in favor of the election of Dr. Ralph B. Eusden as delegate to the A.M.A. please signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast. (Applause.)

SPEAKER ALESEN: The next post to be filled is that of an additional delegate to the A.M.A. Our good president, R. Stanley Kneeshaw, now holds that post through council appointment because that vacancy occurred during the interim of the house of delegates.

Nominations are now in order.

DR. BENDER (San Francisco County): Mr. Chairman, members of the house of delegates: I got a great thrill this afternoon when the Santa Clara delegation suggested that I might do a little something for them. So I nominate for the office of delegate to the A.M.A. to succeed himself, our retiring president, Dr. R. Stanley Kneeshaw. (Applause.)

SPEAKER ALESEN: President Kneeshaw is nominated to succeed himself. Are there other nominations? Hearing none, the chair declares the nominations closed. All those in favor of Dr. Kneeshaw signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Thank you, sir.

We now proceed to item (g), alternate to American Medical Association. Dr. Leopold H. Fraser, Richmond, alternate to H. Gordon MacLean.

DR. TRUMAN: Mr. Speaker and members of the house of delegates: I have been requested by the members of the delegation from Alameda County and Contra Costa County to put in nomination the name of Dr. Leopold Fraser to succeed himself. (Applause.)

SPEAKER ALESEN: Dr. Fraser's name has been placed in nomination to succeed himself. Are there other nominations? Hearing none, the chair declares the nominations closed. All those in favor of Dr. Fraser to succeed himself signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Dr. William H. Leake, Los Angeles, alternate to E. Vincent Askey, term expiring. Nominations are in order for this post.

DR. PAUL FOSTER (Los Angeles): Mr. Speaker, members of the house of delegates of the California Medical Association: It is a privilege for me to nominate a very close friend, a man who has the respect of the entire profession both from a county, state and national level. He has been a great help to organized medicine and it is with pleasure that I nominate Dr. H. Clifford Loos as alternate to E. Vincent Askey to the house of delegates of the American Medical Association. (Applause.)

SPEAKER ALESEN: The name of Dr. H. Clifford Loos has been placed in nomination.

DR. SMITH: Mr. Speaker, and members of the house of delegates: District One has been honored to be invited to second the nomination of Dr. H. Clifford Loos as alternate to E. Vincent Askey to the American Medical Association. As you know, District One is composed of Imperial, Orange, Riverside, San Diego, and San Bernardino, and they asked me to convey this second to the house.

SPEAKER ALESEN: Are there additional nominations to this post? Hearing none, the chair declares the nominations closed. All those in favor of electing Dr. Loos signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next post becoming vacant is that of Dr. C. Kelly Canelo, San Jose, alternate to John W. Cline.

DR. FOX (Santa Clara): Mr. Speaker, members of the house of delegates: It gives me a great deal of pleasure to place in nomination the name of Dr. C. Kelly Canelo to succeed himself as alternate to the A.M.A.

SPEAKER ALESEN: The name of Dr. C. Kelly Canelo has been placed in nomination to succeed himself. Are there other nominations? Hearing no other nominations, the chair declares the nominations closed. All those in favor of Dr. Canelo signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: The next position is that of L. Duke Mahannah, Long Beach, alternate to Donald Cass.

A MEMBER: Mr. Chairman, I rise to a point of order. Was Dr. Canelo elected as alternate to Dr. Cline? I don't believe Dr. Cline was a delegate. We had someone else elected as a delegate.

SPEAKER ALESEN: That is right. I beg your pardon. The chair stands corrected. Dr. Dwight Wilbur was elected as that particular delegate.

The next post is that of Dr. L. Duke Mahannah.

DR. JACOBS: Mr. Speaker, members of the house of delegates: I would like to place in nomination for the office of alternate to the A.M.A. the name of Dr. L. Duke Mahannah, who has served for two years as a member of the council of the Los Angeles County Medical Association and who has served three previous terms as alternate delegate to the A.M.A. (Applause.)

SPEAKER ALESEN: The name of Dr. L. Duke Mahannah has been placed in nomination to succeed himself as alternate to Dr. Donald Cass. Are there other nominations? Hearing none, the chair declares the nominations closed. All those in favor of Dr. L. Duke Mahannah signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Now, alternate to the additional delegate to the A.M.A., Dr. Russel V. Lee, incumbent through council appointment, alternate to R. Stanley Kneeshaw. Nominations are in order.

DR. JOSEPHSON (Santa Clara): Mr. Speaker, members of the House of Delegates: It gives Santa Clara County and myself a particular great pleasure to place in nomination the name of Russel V. Lee to continue his office as alternate.

SPEAKER ALESEN: The name of Dr. Russel V. Lee has been placed in nomination to succeed himself in this post. Are there other nominations? There appearing to be none, the chair declares the nominations closed. All those in favor of Dr. Russel V. Lee signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Mr. Secretary, will you cast the ballot?

SECRETARY GARLAND: Mr. Speaker, the ballot is cast.

SPEAKER ALESEN: Thank you, sir.

DR. JAMES B. GRAESER (Alameda): Mr. Speaker, is there an alternate for Dr. Eusden?

A MEMBER: I believe there is an omission in the program, Mr. Speaker. The term of Elizabeth Hohl is expiring and she was alternate.

SPEAKER ALESEN: How about that Mr. Secretary? Is that correct?

SECRETARY GARLAND: Mr. Speaker, there is an omission in the program for which we apologize.

SPEAKER ALESEN: For which the speaker is responsible. I apologize, ladies and gentlemen of the house of delegates. Nominations are in order for the term of Dr. Elizabeth Hohl, alternate.

Thank you, Dr. Graeser, very much.

DR. HOFFMAN: Mr. Speaker, members of the house of delegates: Sunday morning when you got up you saw a new magazine under your doors. This magazine is the result of a great deal of thought and fulfills the desire of the council and this house of delegates. The editor of this magazine is a man who is respected by all of us and a man who must be broad in his field to undertake such a delicate job. Therefore, it gives me pleasure to present to you the name of Dr. J. Lafe Ludwig as alternate to Dr. Ralph Eusden, delegate to the A.M.A. (Applause.)

DR. GRAESER: Mr. Speaker and members of the house of delegates: It gives me a very great pleasure to nominate for this office my former commanding officer on the good ship *Pinkney*, under whom I served for a number of months, Dr. William Costolow. He has had much experience in the affairs of organized medicine. He is now president of the Los Angeles County Medical Association. I place his name before you for this office.

SPEAKER ALESEN: The name of Dr. William Costolow has been placed in nomination. (Applause.)

DR. MURRAY: Mr. Speaker, members of the house: It gives me a great deal of pleasure to second the nomination of Dr. Lafe Ludwig. Dr. Ludwig is now serving on the Legislative Committee. He has been in that capacity for some time and I assure you that he has done a fine piece of work. I shall be very happy to see him made the alternate to Dr. Ralph Eusden. Thank you.

SPEAKER ALESEN: Are there other nominations?

A MEMBER: Mr. Speaker, I, too, would like to second the nomination of Dr. Costolow. I also happened to be on the good ship *Pinkney* and I know Dr. Costolow well and I know he was well served, and would well serve as an alternate.

SPEAKER ALESEN: Are there other nominations for this post?

DR. KIRCHNER (Los Angeles County): Mr. Speaker, I, too, would like to second the nomination of Dr. J. Lafe Ludwig. In case someone feels he has not had experience, I would like to point out the fact he has been a member of the council of the Los Angeles County Medical Association. He has been a delegate here. He is on the executive council of the Medical Veterans of Los Angeles County, and he is on the council of the Public Health League and he is, as Dwight Murray has said, a member of the Legislative Committee. It gives me a great deal of pleasure to second this nomination.

SPEAKER ALESEN: Are there other nominations for this post? Hearing no additional nominations, the chair declares them closed. We will pass the ballot. You are voting for the post of alternate to Dr. Ralph Eusden. The names are Dr. J. Lafe Ludwig and Dr. William Costolow.

We will appoint tellers.

. . . Appointment of tellers. . . .

SPEAKER ALESEN: The last item before we adjourn will be the report of the committee on com-

mittees, Dr. Hartzell Ray. Dr. Hartzell Ray is recognized by the chair.

REPORT OF THE COMMITTEE ON COMMITTEES

DR. HARTZELL RAY: Mr. Chairman, members of the house: I wish to announce the council nominations of new members on the standing committees, and I will mention only the new members that are going on, not the whole committee.

Committee on Associated Societies and Technical Groups, Robert A. Scarborough, San Francisco, 1953.

Committee on Health and Public Instruction, Orrin Cook, Sacramento, 1953.

Committee on History and Obituaries, D. Powell, Stockton, 1953.

Committee on Hospitals, Dispensaries and Clinics, John B. Hamilton, Glendale, 1953.

Committee on Industrial Practice, Raymond Wallerius, Sacramento, 1953.

Committee on Medical Defense, Leslie Magoon, San Jose, 1953.

Committee on Medical Economics, Hallis Carey, Gridley, 1953.

Committee on Medical Education and Medical Institutions, Louis Bullock, Los Angeles, 1953.

Committee on Membership and Organization, Carl L. Mulfinger, Los Angeles, 1953.

Committee on Postgraduate Activities, Ed Rosenow, Pasadena, 1953. And on that same committee, Carroll Andrews to replace another member.

Committee on Publications, George Dawson, Napa, 1953.

Committee on Public Policy and Legislation, Dwight H. Murray, Napa, 1953.

Committee on Scientific Work, Robert L. Dennis, San Jose, 1953.

Physicians' Benevolence Committee, Axcel E. Anderson, chairman; Elizabeth Mason Hohl, and John W. Sherrick.

Mr. Chairman, I move you the adoption of this report.

SPEAKER ALESEN: Do I hear a second?

. . . The motion was seconded, put to a vote, and it was carried. . . .

SPEAKER ALESEN: Dr. Clifford Loos, chairman of the Resolutions Committee No. 3, has an announcement to make to the house at this time. Dr. Loos.

DR. LOOS: Mr. Speaker and members of the house: I want to remind everyone that tonight is the last time in which you can enter any amendments you care to, or not amendments, but any factors that you wish to add to the new constitution as it was put on the table Sunday night. Tonight will be the last chance. That has to stand over for one year before it is voted upon at our next session, and if you have any amendments whatsoever or ideas that you want to put in this new constitution, you must get them in to put on the table this evening. The members of the Reference Committee, Dr. Heron, Dr. Smith, and myself will be around if you care to consult us.

SPEAKER ALESEN: Do you wish to take a recess to return at 7:45 and have the announcement of the election then? What is your wish?

DR. MARTIN: I so move that we adjourn.

. . . The motion was seconded, put to a vote, and it was carried, and the meeting adjourned at 6:30 p.m. to reconvene at 7:45 p.m. the same evening. . . .

RECONVENING OF HOUSE OF DELEGATES

The house of delegates reconvened at 8:00 o'clock p.m. The meeting was called to order by Vice-Speaker Donald Charnock, who presided.

VICE-SPEAKER CHARNOCK: The house of delegates will be in order. The first item of business will be the report of the chairman of the tellers, Dr. Frank Otto.

DR. OTTO: Mr. Speaker, the board of tellers consisting of Dr. Bender, Dr. Donald and myself, announce the election of Dr. Lafe Ludwig. (Applause.)

VICE-SPEAKER CHARNOCK: Dr. Lafe Ludwig is declared elected. We will now call on President Kneeshaw to perform a very pleasant duty.

PRESIDENT KNEESHAW: I would like to ask Ben Frees to escort Dr. Leonard Stovall to the rostrum. Thank you, Ben.

Thank you for coming, Dr. Stovall. The California Medical Association wishes to honor Dr. Leonard Stovall of Los Angeles. He is a practitioner in Los Angeles and has been a member of the Los Angeles Association for a good many years. He is outstanding in his district, and he is the first man of his race to be elected to the house of delegates of the California Medical Association. I congratulate you. (Applause.)

DR. STOVALL: Mr. President and members of the house of delegates: This is the greatest honor I have had in my life. It came so unexpectedly. I feel highly grateful to Dr. Ben Frees and Dr. Paul Foster who I am quite sure indorsed me, when my name came up, or maybe they proposed it.

I think I would be very vain to assume this is just a personal honor. I feel that this is more than just a personal honor. It is something that helps to create the good will with the other Negro doctors and to get them interested in the work of the association.

I accept this honor with a sense of guilt, however, because I have done so very little in the way of public boosting of the cause of the County Medical Association or the California Medical Association. But from now on I am going to take an interest. I feel grateful to those doctors who have done so much in campaigning to keep the practice of medicine free and give us all a chance, and I think this gesture of having me in the house of delegates is one of the finest gestures towards making the American democracy a real democracy instead of just some rhetorical phrases. Thank you. (Applause.)

PRESIDENT KNEESHAW: Thank you, Dr. Stovall, and now we have go. one more good worker for the cause.

VICE-SPEAKER CHARNOCK: The chair recognizes Dr. Eugene F. Hoffman. Dr. Hoffman.

Well, we will have to recognize him later.

We come now to item seven, reports of reference committees, which will first be the report of Reference Committee No. 1, reports of officers, the council and standing and special committees. Dr. Reynolds.

REPORT OF REFERENCE COMMITTEE No. 1

DR. T. ERIC REYNOLDS (chairman): Mr. Speaker, members of the house of delegates: First of all, I apologize for coming up here to the rostrum instead of to the microphone before me, but taking a cue from Dr. Alesen, I can plead that it is the trouble with the lights instead of perhaps admitting the real reason might be that my knees are shaking and I need to be up here to hide them. (Laughter.)

There are a few words of preamble that I want to say about the report of this reference committee.

The committee consists of Dr. Leslie Magoon, Dr. Ralph Teall and myself as chairman.

We met early yesterday morning with the hope and thought that we could transact our business rapidly enough to permit me to conduct the hearing before the resolutions committee of the California Physicians' Service. However, that was not possible and I had to ask my two colleagues to do all of the work. They deserve most of the credit and I reserve the right to take a third of the blame.

There will be a little of a surprise in this report inasmuch as it is my understanding that it is usually a very perfunctory office to fulfill.

Reference Committee No. 1 meets and with a small amount of hoopla, they pass the thing along and that is it. I have even been told about one occasion when some strong-voiced and heavy-lunged individual prolonged it into many minutes and I fear that ours is going to take a little longer than is usual.

However, your committee has reviewed the reports of the general officers (with the exception of the secretary and executive secretary, whose reports will be reviewed by Reference Committee No. 2), the individual councilors, the president of the trustees of the California Medical Association, the legal department and the editor of CALIFORNIA MEDICINE. We heartily commend all these officers for the energy and intelligence with which they have discharged their responsibilities. Their reports have been printed in the Pre-Convention Bulletin, copies of which have been distributed to all members of the house; you are urged to read them.

Your committee recommends the approval of these reports. Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: The committee recognizes in addition to this the extreme value and earnestness and the amount of work and time that is spent by anyone in organized medicine who takes the trouble to do anything for it and the committee, as an aside and not in its printed report, wishes again to emphasize that any suggestions or criticisms that may occur, are in no manner intended to be of a carping and destructive nature but simply the committee felt that since there was such a committee, its duty was to scrutinize properly the reports as they are printed.

Your committee has reviewed the reports of the following committees: Executive Committee, Committee on Associated Societies and Technical Groups, Committee on Health and Public Instruction, Committee on History and Obituaries, Committee on Hospitals, Dispensaries and Clinics, Committee on Medical Defense, Committee on Medical Education and Medical Institutions, Committee on Membership and Organization, Committee on Postgraduate Activities, Committee on Publications, Committee on Scientific Work, Physicians' Benevolence Committee, the Committee on Public Relations, and the Cancer Commission.

Your committee recommends the approval of these reports. Mr. Speaker, I move the adoption of this section of the report.

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: Your committee has reviewed the reports of the Blood Bank Commission, the Committee on Industrial Health, and the Committee on Rural Medical Service.

Your committee recommends the approval of these reports. Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

Your committee has reviewed the written and oral supplemental reports of the Committee on Public Policy and Legislation. We commend Dr. Murray and the members of his committee for the intensity and success of their efforts. Your committee recommends approval of these reports, but would suggest that, in the future, specific recommendations of political candidates by name, not be made in open sessions of this house.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: Your committee has reviewed the report of the editorial board of CALIFORNIA MEDICINE. Your committee recommends the approval of this report, but submits the following: We note that a directive adopted last year by the house of delegates, that representation from the section of general practice be added to the board, has not yet been effected. This committee repeats that recommendation.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: The next section, which was omitted due to last-minute work by other committees, will be omitted and we go on to section seven.

Your committee has reviewed the report of the Advisory Planning Committee. The Advisory Planning Committee consists of the executive secretaries of the component county medical societies, the executive and field secretaries of the C.M.A., the legal counsel of the C.M.A., and the executive director of the Public Health League. It was organized several years ago at the direction of this house to act as an advisory committee to the council.

The report of this committee as submitted is at least technically inaccurate when it states: "The Advisory Planning Committee has continued to meet during 1949, . . ." when, as a matter of fact and to the best of our knowledge, it has met once in the last twenty months. Your reference committee is therefore moved to present the following amended report:

Representing as it does a body of highly trained men, each of whom is well versed in either or both of the fields of economics and public relations, and all of whom are laymen but still fully familiar with, and sympathetic to, the problems of medicine, it would seem that the Advisory Planning Committee should be in a position to render extremely valuable services to the council and the association. But, so far as is determinable, its advice as a committee has on no recent occasion been sought by the council, and its failure to meet by itself cannot but mean that it does not function.

It is felt that for the Advisory Planning Committee to be fully effective and able to serve its highest purpose, the following reforms in its functioning and procedures should be made:

1. The Advisory Planning Committee should formally be organized with appropriate officers, a full record of its proceedings should be kept, and definite channels of communication between the committee and the council should be specified and adhered to.

2. The Advisory Planning Committee should be furnished the proposed agenda of the council meeting, and should consider, and be prepared to recommend concerning any item on that agenda which raises problems related to the fields in which they may be qualified to advise.

3. As a matter of policy and of regular practice, the council should seek the advice of the Advisory Planning Committee whenever the nature of the problem under consideration would make it seem appropriate.

It is believed to be a legitimate and desirable function of the Advisory Planning Committee on its own initiative to devise and develop tentative programs in the various fields of endeavor of the Association for presentation to the council. It is thought that the Advisory Planning Committee should be encouraged to exercise such initiative, and the council should be encouraged in seeking the advice of these experts on economics and public relations who are already conveniently at hand, and who already are on the payrolls of the association or of the component societies.

Your committee recommends the approval of this report as amended.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: Your committee has carefully reviewed the report of the council, and has perceived a tendency for rather hasty action affecting important policy matters. The committee recommends that whenever possible the council give adequate notice and allow all interested affected parties to appear and present their views.

We recommend that, in the future, the council make every effort to try to anticipate and thereby to avoid emergencies which seem to necessitate hasty decision. We also recommend that the council make every effort to keep the membership informed of proposed changes in policy before binding decisions are made on behalf of the C.M.A. as a whole.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

A MEMBER: I would like to rise to a point of order. Would you please inform me on what page this information may be found so the delegates can refer to it? We are listening to a lot of words, and we cannot decipher from the floor exactly what the meaning of this resolution is. Do you have any copies for the rest of us to refer to in your discussion or is this a lot of poppycock we are supposed to swallow as we did some of it?

VICE-SPEAKER CHARNOCK: As the report of the Reference Committee No. 1 has not been mimeographed, this is the only copy.

SAME MEMBER: May I ask why?

VICE-SPEAKER CHARNOCK: I will let the chairman of the committee answer that.

DR. REYNOLDS: The reason why is that there was not sufficient time in which to consult all the interested parties and to prepare a report that could be mimeographed in time.

SAME MEMBER: That is very strange when committee No. 3 has all their reports back and all the copies so we can properly peruse the thing and pass on it in an intelligent manner. I assure you from where I sit and with the surrounding members we have here, we are unable to decipher the intent and meaning of the chair.

DR. REYNOLDS: It is noted that the council has, in many instances, taken to itself some of the functions for which standing committees are provided by our constitution and by-laws. One result is that several standing committees have had little or no function to perform. This is evidenced by reports that such committees did not meet during the year.

Your committee recommends to the House that the by-laws be amended so as to reduce the number and streamline the efficiency of the standing committee.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: It is noted in the reports of the district councilors that there is an increasing use of full-time executive secretaries by component county societies within the various districts. This development is viewed with favor and its extension is strongly urged.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. REYNOLDS: Mr. Speaker, I move the adoption of the report as a whole.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded to receive the report of the reference committee as a whole. Are you ready for the question?

. . . The question was called for, the motion was put to a vote and it was carried. . . .

VICE-SPEAKER CHARNOCK: The chair will now recognize Dr. Eugene Hoffman.

DR. HOFFMAN: Mr. Speaker, members of the house: At the session on Sunday evening you were told that one of our faithful employees, Mr. Ben Read, is convalescing from rather severe surgery.

Mr. Speaker, I move that the secretary be instructed to write a letter commending Mr. Read for his faithful services and wishing him a speedy recovery.

SEVERAL MEMBERS: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded that the secretary write a letter to Mr. Ben Read wishing him a speedy recovery. Those who are in favor will signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

DR. HOFFMAN: Thank you, Mr. Speaker.

VICE-SPEAKER CHARNOCK: The next item of business is the report of Reference Committee No. 2 on reports of the secretary-treasurer and the executive secretary, on budget and dues. Dr. Truman will make this report.

REPORT OF REFERENCE COMMITTEE No. 2

DR. STANLEY TRUMAN (chairman): Mr. Speaker, and members of the house of delegates: Your committee has reviewed the report of the secretary and recommends the acceptance of this report, specifically calling to the attention of the council that section of the report recommending that a part-time or full-time physician be employed as secretary. We wish to express the appreciation of the members of the house of delegates and the members of the California Medical Association for Dr. Garland's long and arduous labors in our behalf and express our appreciation for his continued efforts in our behalf.

Mr. Speaker, I move the adoption of this section of our report.

VICE-PRESIDENT CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. TRUMAN: The report of the executive secretary has been reviewed and your committee recommends its acceptance as printed and we wish to express our deep appreciation of the capable services and enthusiastic help of Mr. John Hunton through the year.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Is there a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. TRUMAN: The report of the treasurer has been published in the annual bulletin and this has been made available to the members of the house of delegates. It consists primarily of an audit by the certified public accountants, the auditing firm of Hood and Strong. The committee finds the audit in order and recommends the acceptance of this report.

Mr. Speaker, I move the adoption of this section of the report.

VICE-SPEAKER CHARNOCK: Do I hear a second?

. . . The motion was seconded, put to a vote and it was carried. . . .

DR. TRUMAN: Your committee has studied the budget for the 1950-51 fiscal year approved by the council. This budget estimates income for the fiscal year in the amount of $438,200 and expenditures in the amount of $431,350, exclusive of the operations of the official journal, which is budgeted to be self-supporting.

The budget approved by the council includes an item of $150,000 for the association's public relations program for the coming fiscal year. This item has been set to include the continuation of the present radio program, "California Caravan," and also to establish a grass roots public relations program based upon the development of sound fundamental public relations at the level of the county medical society and its individual members.

Your committee feels that the inauguration of the grass roots public relations program is most es-

sential at this time, particularly for its usefulness in providing a foundation of public relations activities on a permanent basis. Accordingly, your committee has approved the inclusion of the item of $150,000 in the budget for the entire public relations program as outlined and approved by the council. However, your committee feels that further consideration should be given to the advisability of continuing the "California Caravan" radio program and your committee recommends that this program be discontinued as of January 1, 1951, unless immediately prior to that time it is the consensus of two-thirds of the members of the council that it is essential to continue the radio program for a longer period in the interests of the over-all public relations of the association. Upon the discontinuation of the present radio program it is the recommendation of your committee that the unexpended balance in the public relations budget item be spent in more effective methods of public relations and publicity activities.

Your committee believes that the budget as recommended by the committee includes sufficient funds to make money available, on the vote of the council, for public relations activities at the county level where such activities are considered to be beneficial for state-wide application. In this belief your committee recommends that no further action be taken on resolution No. 14 introduced by Dr. Leon Fox of Santa Clara County.

The budget as recommended will be a balanced budget on the basis of dues for the calendar year 1951 from $45 to $40 per active member and your committee recommends that the dues for 1951 be $40.

Mr. Speaker, I move the adoption of this section of the report.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded that this section of the report be adopted.

DR. DE LOS REYES: Mr. Speaker, may I have the microphone to comment on that part of the resolution?

VICE-SPEAKER CHARNOCK: Yes, indeed.

DR. DE LOS REYES: I see that it has been recommended to you that we delete "California Caravan." So I understand. Is that right?

DR. TRUMAN: As of January 1, 1951.

DR. DE LOS REYES: I don't know how many of you fellows have gone out to speak to service clubs, to women's clubs, to labor unions, but everywhere we go, at least that I go, I find that one of the bright lights regarding public relations in the State of California, is the fact that both the P.-T.A and Federation of Women's Clubs in California have commended this particular part of our public relations. Even the labor unions, as radical as Mr. Bridges and San Pedro are, are willing to agree that "California Caravan" has done a lot of good for California.

I was one of those who were very critical of "California Caravan." As a matter of fact, I was very vocal and very articulate about it, but I have learned that we have been a little bit impetuous and hasty in our criticism.

Since I have gone out I have found that they, and the people of California especially the P.-T.A. and all those people who are particularly as vocal as we are, would like to see "California Caravan" continued.

I understand it costs us $8 a year. Are we willing to cut off our noses to spite our faces for the sake of $8 per member per year when we know according to breakdown there are over 900,000 people in the state of California that are listening to it and believing what is being said in "California Caravan"?

Let's be sensible and let's be practical and let's continue "California Caravan." Again, I repeat, let us not cut off our noses to spite our faces. Thank you. (Applause.)

VICE-SPEAKER CHARNOCK: Is there further debate on this? Dr. Remmen.

DR. REMMEN: Mr. Speaker, is this the opportune time to debate "California Caravan"? There are two resolutions coming up in which "California Caravan" is coming up, and I should think that would be the best time to debate that.

DR. LOOS: Mr. Speaker, we felt this resolution would come up ahead of ours with Reference Committee No. 2, and there would be no action taken on the resolution submitted to No. 3 committee. Therefore, we would prefer to have it debated at this time.

DR. ASKEY: Mr. Chairman, I would like to move an amendment before the debate on this, if I may, sir, for clarification only.

VICE-SPEAKER CHARNOCK: Yes.

DR. ASKEY: I am merely doing this for clarification. It seems that this report is made up of several things and for the basis of clarification only, I think it would be wise if we accepted that part of the report which is not germane to this one subject, that we might not be adopting a lot of things at one time or disabusing and rejecting some things which we might not wish. I therefore move you, sir, that this portion of the report which is given to us dealing with "California Caravan" be made a special order of discussion in order that there may be no misunderstanding as to what we are discussing. I move you that, sir.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded that the portion of the report dealing with "California Caravan" be made a special topic of discussion.

. . . The motion was put to a vote and it was carried. . . .

A MEMBER: I rise to a point of order. Is there no discussion?

VICE-SPEAKER CHARNOCK: I am sorry. We will have discussion on it.

A MEMBER: Does that exclude the division of the $150,000? Does that exclude any explanation of the amount of $150,000 and what it is for?

VICE-SPEAKER CHARNOCK: I think the chairman of the reference committee will explain that.

DR. TRUMAN: I shall be very happy to explain that. It will require a little further reading. Shall I read that at this time or do you wish to hear further discussion on "California Caravan?"

VICE-SPEAKER CHARNOCK: I think at this time we should discuss "California Caravan" as the motion just passed has outlined.

DR. TRUMAN: I think that motion was passed out of order because no discussion was had, Mr. Speaker, on that motion. When it was called for, several people wished to discuss it, and no discussion was called for.

VICE-SPEAKER CHARNOCK: All right. We will call for discussion of the motion of Dr. Askey at this time to discuss the proposition of "California Caravan."

DR. TRUMAN: I would like to speak to that if I may, sir.

VICE-SPEAKER CHARNOCK: Go ahead.

DR. TRUMAN: The whole item of "California Caravan" is included as part of the recommended public relations program and I do not see how it can be isolated. If the house of delegates should like to have me explain the full program I shall attempt to do so. If I cannot do so adequately, I think members of the council should be called upon.

VICE-SPEAKER CHARNOCK: Is there any more discussion of this motion at this time? The discussion of the problem of "California Caravan"?

A MEMBER: Mr. Speaker, it cannot be discussed if this is going to close up any discussion of the other items.

VICE-SPEAKER CHARNOCK: No, sir. This is only about "California Caravan."

A MEMBER: As I understood the motion, everything was to be passed except the discussion of "California Caravan."

. . . There were several cries of "No." . . .

VICE-SPEAKER CHARNOCK: The motion was to discuss "California Caravan" separately, aside from every other item in the report.

A MEMBER: I will second the motion as you stated it.

A MEMBER: Mr. Speaker, I move we postpone debate on that motion until after we have heard the full report of the committee.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: That is an amendment to the motion and is in order.

A MEMBER: Mr. Speaker, may I make an amendment to the amendment?

VICE-SPEAKER CHARNOCK: All right. We have an amendment now of the second degree. Is there a question to that? Does anyone want to discuss that?

A MEMBER: What is the second amendment?

VICE-SPEAKER CHARNOCK: The second amendment is that we will hear the rest of the report before we discuss "California Caravan."

. . . Calls for the question. . . .

VICE-SPEAKER CHARNOCK: All those in favor of the amendment to hear all of the report before we discuss "California Caravan" signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

VICE-SPEAKER CHARNOCK: Now, the motion before the house is to discuss "California Caravan" separately.

. . . Calls for the question. . . .

VICE-SPEAKER CHARNOCK: The prevailing question at the present time, and the chair so rules, is that we listen to the report in its entirety, then to discuss "California Caravan." All those in favor of listening to the report, I mean the entire report, will signify by saying, "aye."

. . . The motion was put to a vote and it was carried.

DR. ASKEY: Mr. Chairman, as a point of order, that was passed. The thing before the house is my motion as amended, and if you pass this motion which I made as amended we would then hear the rest of this report, and then take up "California Caravan" and then pass or reject the motion as made by the chair. My motion is before the house as amended, which merely means that we hear his report before you take up "California Caravan" separately if my motion passes.

DR. TRUMAN: Let's do it anyway. (Laughter.)

VICE-SPEAKER CHARNOCK: We will now hear the balance of the report.

DR. TRUMAN: We are all here to try and make progress and arrive at a program that is acceptable and for the best interests of the doctors of California. The council has prepared a public relations program as part of the program for the California Medical Association, and I think that it will take very few moments to give you an idea of what is in the council's mind to tell you that they proposed to call your attention again to the committee's recommended alteration of their program. The report adopted by the council, coming from the Auditing Committee, is as follows:

"The California Medical Association has been engaged since 1945 in a campaign of public education, designed primarily to bring to the attention of the public the knowledge of the availability of voluntary forms of health insurance and the inadvisability of entering into a politically-controlled scheme of compulsory health insurance. The campaign has been directed by Whitaker & Baxter and has succeeded eminently in accomplishing its purpose.

"The present campaign was dictated originally, and has been carried on for five years, by political pressure. It is safe to say that had Governor Warren

not introduced his health insurance bill, the association would not have entered into a public relations campaign of this type.

"The major phase of activity in the current campaign came in 1946 and 1947, when 'voluntary health insurance weeks' were staged in 53 of the 58 counties of the state. This was grass roots campaigning at its best, and it is evident that these county-by-county drives succeeded in arousing a public awareness of the availability of voluntary health insurance. Since the close of the county campaigns, the association's public relations program has consisted almost entirely of the maintenance of a weekly radio program, 'California Caravan.'

"During this five-year period it has become evident that the program being followed was one of an emergency nature and that planning for a long-range campaign to strengthen the underlying relations of the medical profession with the public would require a different approach. The experience gained in Los Angeles, Alameda, Santa Clara, San Francisco, Fresno, Kern, Orange, San Diego, and other counties indicates the need of bringing the importance of sound public relations right down to the county medical society and to its individual members. Just as every physician is regarded as a cancer detection center, so every physician must be regarded as a public relations outlet. The aggregate sum of the public relations of all individual physicians is the public relations of the profession as a whole.

"At the present time the political threat which hung over medicine's head in California in 1945 is still imminent; the 1950 elections are most crucial. Problems of medical service, such as night calls by physicians, overcharges for services rendered, rebates and other difficulties are still with us but are not blatantly and continuously in newspaper headlines. The problem today is one of basic issues, and such measures as are needed to meet specific existing legislative threats.

"On the basis of the above beliefs, the Auditing Committee recommends the establishment of a public relations or public service department within the California Medical Association. The functions of this department would be to develop and put into operation a true grass roots program of public service. Its work would be aimed at a long-range accomplishment of the truest meaning of public relations and would not be spectacular.

"This department should operate directly under the supervision of the council and under the direction of the office of the association. Its personnel should be based upon present personnel, aided by our public relations consultant and where necessary by additional employees to handle field work or office duties which would free persent personnel for field duties.

"The committee has considered carefully the matter of personnel for this program and has decided that present employees of the Association and its affiliated organizations are better qualified to handle this program than would be any newly-employed people. Years of experience are necessary to acquaint any employee with the relationships of the medical profession with the public.

"A review of public relations organizations shows that in nearly every instance the guiding spirit of the organization is a former newspaper man, trained in the use of words and experienced in dealing with people from all strata of life. The association now has three former newspaper men in its employ or that of affiliated organizations. John Hunton, executive secretary, Ed Clancy, field secretary, and Ben Read, executive secretary of the Public Health League of California, all fall into this classification. In addition to their backgrounds in newspaper work, they have long worked with physicians and they are intimate with the problems of the profession.

"The Auditing Committee recommends that these three men, augmented by Mr. Howard Hassard, legal counsel, shall constitute the 'working crew' for the public service program.

"The committee further recommends that this 'working crew' take into continuous consultation a number of other qualified employees of affiliated organizations. Such consultation would be for the twofold purpose of gaining information which these additional people have and for putting into operation the program worked out for statewide consumption.

"The committee calls attention to the fact that in the past ten years the association has grown from a scientific society of some 5,000 members to a vocal active, aggressive organization of more than 10,000 members. Its finances have grown from an annual budget of about $100,000 to one of around $400,000, and its influence in social, economic and political matters has gained immeasurably in stature.

"Along with the growth of the C.M.A. has come a corresponding growth in size and influence of its component county units. There are today full-time executive secretaries in nine of the forty county medical societies, representing 80 per cent of the association's membership. Each of these men is well versed in public service and public relations and each is ready to take on a well conceived and well managed program. In those counties which do not maintain a full-time office and secretary, the services of a state-planned program are particularly needed.

"The committee recommends that each county society executive secretary be made a part of the advisory committee to the 'working crew.' It also recommends that the public relations staffs of associated and affiliated groups and organizations be considered as consultants and assistants in this program. Finally, it recommends that liaison be maintained at all times with the Woman's Auxiliary and with local health officers.

"With the above personnel as both the working and advisory staff, the committee recommends that the program be instituted through personal contacts. The officers and councils of the association should work closely with the 'working crew' in making personal appearances before the county

medical societies. The county-by-county visits of the president and president-elect should be reestablished on a systematic basis, along with a presentation of the public service program by the 'working crew.'

"At the outset, Messrs. Hunton and Clancy would represent the field working staff. On the basis of their experience, field workers could be employed and trained, as the demand for them became evident. If additional employees are needed in the C.M.A. offices to handle routine matters, such employees should be hired.

"The program to be discussed with the county societies and with their members should be the factors already developed or in process of development by the county societies and by the Committee on Medical Economics of the C.M.A. From the information available it is possible to establish standard practices which are aimed at creating favorable public opinion and eliminating questionable practices which react unfavorably against the medical profession in the public mind.

"The Auditing Committee is not prepared at this time to present specific examples of the type of material it envisages in the above recommendations. However, it believes that the county medical societies and their members should be approached with three primary objectives in mind:

"1. Influencing the county medical society to improve the quality of medical care in its area to the point where the public receives nothing short of the best.

"2. Making a study of medical needs and working toward the possibility of making a guarantee to the public of the availability of high-quality medical care for all, regardless of ability to pay.

"3. Making every physician a public service outlet, working for the good of the profession.

"The inauguration of this program would call for:

"1. That 'California Caravan' be continued, but conformed according to the suggestions made by Mr. Whitaker at a recent council meeting (April 29, 1950).

"2. That the use of advertising media, such as radio, newspaper, television, magazines, be utilized as deemed necessary.

"3. The use of news releases on medical topics as well as social, economic, political and scientific.

"The committee recommends that the public relations budget for the 1950-51 fiscal year be established at a maximum of $150,000. This sum is considered ample to launch the proposed enlarged program. The Auditing Committee recommends that the dues of the Association for 1951 be reduced to $40 from $45.

"The Auditing Committee attaches to this report, as a part of it, a proposed 1950-51 budget. This budget includes those items already approved by the council and also the proposed items of $40 for 1951 dues and $150,000 for the 1950-51 public service program."

The committee recommended, and it was accepted, that the budget be established as the reference committee has presented it.

I will be glad to try and answer any questions. (Applause.)

VICE-SPEAKER CHARNOCK: Thank you, Dr. Truman.

The debate now will be on the status of "California Caravan," and Dr. Remmen has already been given the floor.

DR. REMMEN: Mr. Speaker, members of the house and guests: I feel that any consideration of "California Caravan" cannot be made entirely apart from a consideration of the problem of public relations in a somewhat larger sense. Certainly we must have public relations. In these times of problems and stress we must carry our message to the public. I think it is only a question of how we do it, and I think that sometimes we have in our haste—and I blame no one, for in times of war there can be no time to sit down and deliberate on many occasions. But what I have to say is not critical of anyone, nor is it critical of anything that has been done. It is merely an attempt to point out a few of the many facets of the problem of public relations as we face it.

A speaker before a reference committee said yesterday that we laymen know nothing of public relations. He said that we know no more about public relations than our patients know about medicine. I have some patients who know more about pills than I do, and they know it because they have taken so many more pills than I have. I can't give them a pill without a whale of a lot of public relations work and a lot of propaganda in order to get the pill started down, and even then I may have to continue the public relations from day to day, and I am dealing there with a patient who is something of a connoisseur of pills. In other words, he knows something of my profession. He knows it pretty well.

In the field of public relations we deal with matters of everyday experience. We are all salesmen. Every one of you in this room is reasonably successful and he wouldn't be if he hadn't known something of how to approach people, how to influence them and how to sell.

We know what pleases our friends. We know what pleases our families, our children. If you want to put something over at the country club or if you want to get some idea over in one of your groups, you go out and sell it. You don't necessarily haul in a publicity or public relations expert, although I do not question the value of public relations people.

What I am trying to say is we, as the employers, must give very great thought to anything that we undertake or continue along this line. Public relations, or publicity, shall I say, is a very important weapon. It is two-edged. It can come back and ruin you or it can do a very wonderful job for you.

I told the reference committee about the experience of the American Tobacco Company with their campaign against spit. Do you remember the campaign, "Spit is an ugly word. Everybody else's

cigars are made with it, but our cigars are closed in another manner, with water, machinery. Cigars aren't touched by hand," and so on.

What was the big idea? Some high-powered publicity agent caught on that one and went on to carry out their campaign against salivary cigars. What happened? It wasn't very long until every cigar company in the country was screaming, "Cut out that campaign. We are just not selling cigars. Every time anybody sees a cigar they think of spit contamination and the deal is off."

They had to stop that campaign.

Many, many other campaigns on common articles have misfired. Many people won't have a cake of Lifebuoy soap in the house. B. O. is associated with Lifebuoy soap and if there is B. O. in your house, well, maybe your friends will think that you have bought it when they come in.

I only mention that to show some of the kickbacks on public relations. We have had one ourselves. I don't know how many of you have seen it yet, but the opponents, our opponents, the proponents of socialized medicine, have waited until millions of pictures, copies of that grand old painting "The Doctor," had been spread all over the United States as a symbol of the American Medical Association. These gentlemen who desire compulsory health insurance have now taken that picture. They have taken one end of the cottage out. Up in the sky one sees a beautiful vision of a fine, modern hospital with operating rooms, laboratory equipment, the heads of the parents are turned hopefully to look at the vision in the sky of the hospital and the old doctor is still sitting looking down at the child and the caption is, "Do you want the A.M.A.'s kind of medicine or do you want what compulsory health insurance will give you?"

Now, I suppose nothing could be devised that wouldn't kick back. But, nevertheless, is it the part of wisdom to take the medicine of 125 years ago and take a picture which was painted, actually not for glorification of a doctor but to show the pathetic conditions under which the poor lived because the painter was a friend and illustrator for Charles Dickens, and you know his attitude toward poverty.

Well, that is one thing that can happen from public relations, and I think perhaps you should be put on your guard in future programs. Hadn't we better be telling the people about modern medicine? Hadn't we better be telling them what our great researchers have done, about our marvelous clinics, about our brain surgery, how we can take a lung out, about how all that has been developed, and shouldn't we tell them also you couldn't do it for $1 a month or $2 a month? It has got to be done and paid for, and the American public will have to be told that if they want complete coverage including catastrophic coverage that it can't be done for $30 or $40 or $50 a month.

In one of the circulars put out by the A.M.A. at the present time, these statements are made. Understand, I am not objecting to these things. I think much of this work is very fine. I am only trying to point out a few pitfalls for your consideration.

It says there are hundreds of voluntary health insurance plans sponsored by physicians, hospitals, insurance companies, labor unions, industrial concerns, and so on, competing with one another and operating on sound insurance principles. They offer plans to fit the health needs and pocketbooks of every individual and every family.

Now, I ask you, if a family comes to you and says, "Doctor, we don't belong to any employed group, but we would like complete and adequate coverage for all the illnesses that will befall our family," just which one of those plans are you going to recommend to them?

I don't know and I am not in a position at the present time to recommend such a plan because I don't think such plans exist as yet. I think we are going to have to sell the public on what plans we are going to give them.

Further, it says, "The cost is low. Medical and surgery bills, sound protection against major surgical hospital bills cost only ten cents a day for an individual and twenty cents a day for a family, $36 a year or $72 a year for a family."

I am told by some of those who may know something about it that the cost of adequate coverage to a family will probably run $125 to $175 a year. Probably somewhere within those extremes, if you are to cover them properly, give them the care they should have. Now, we are going to have to sell that to the American people, at least to that level of American people who want compulsory health insurance. It isn't an excessive amount for people whose incomes are $3,500, $4,000 or $5,000.

I don't know, I am not an economist, but there is nothing wrong with C.P.S. that couldn't be cured by adequate premiums paid by the people. Let's be frank about this thing. Let's be honest and let's go to the people somehow and tell them we will give them the medical care that they want, but that they will have to pay what it costs, just as they pay for automobiles.

You can't sell them a 1910 Ford, which is comparable to selling them the 1920 doctor. You have got to sell them a modern automobile because that is the only thing that they will buy, and they will sacrifice to pay for it, but first they have got to be convinced of the necessity of it.

I wonder if we have been doing that with C.P.S. or with anything else as yet? It is very difficult to estimate the effects of public relations programs on anything as intangible as public opinion. Certainly you can tell right away whether it is boosting your cigarette sale or your Lifebuoy sale, but public opinion is another matter. That is hard to estimate.

It is said here in a circular put out by the same source, Whitaker & Baxter I think it is, that perhaps the best indication of whether that judgment is sound, lies in the fact that a year ago today you all remember that our major concern outside of stopping the then-threatened legislation was how to get medicine off the defensive.

Today it is off. It is that simple. You start a pub-

licity program and then you don't have to worry. After a year the heat is off.

The heat is not off. We are still on the defensive and we will be on the defensive until such time as we have flooded this country with adequate and complete voluntary health insurance of the type that will give full coverage, and when we have people educated to pay for it as they pay for life insurance or automobiles or refrigerators or everything else.

Now we have made a fine start, but let's not kid ourselves that the heat is off. I have been accused in the past of saying that compulsory health insurance was dead. I never made such a silly statement in my life excepting in a quotation or else regarding the particular item of legislation.

The heat isn't off. We have got a long way to go in a big way, but when I think back ten years, look at what we have accomplished.

In this association or in California we have faced two severe crises. I know Dr. Murray will bear me out that there are lesser crises every year. It isn't something that you can go away and forget.

Back in 1935 when we asked for a compulsory health insurance bill and when Dr. John Harris and his committee of which I was one, were faced with the problem of presenting a compulsory health insurance bill which had been ordered for this house of delegates and which we knew the people didn't want, we had no public relations firm. Nobody ever thought of such a thing. We had no funds. What could you do? Well, all we could do was to let everybody who wanted to get in on that health insurance bill come in and make their suggestions and their demands and fortunately it got so expensive that people wouldn't have it. They weren't used to payroll deductions and that was killed.

Now the recent crisis was an entirely different thing. It grew out of people being cut loose from government payrolls. It didn't grow out of a depression. I certainly don't want to talk all night about this thing. I think we have got to decide and think a lot about how we are going to spend this money. We can't leave that decision entirely to the public relations people. We know the problems and we have got to decide what is to be done.

The public relations person is invaluable in telling you how to get into the papers, how to get on the radio, in writing your script, if you are watching him carefully and in doing much of that type of work, handling the great mailings and all that sort of thing. We have got to decide how it is to be done. What are we going to talk to people about on C.P.S.? Are we going to talk to them about the kind of medical care they are to have: about how much it costs to build a hospital; how much an x-ray machine costs: how much it will cost, and emphasize that it will cost the government at least 100 per cent more to do the same job, or he will get a lot worse quality?

Are we going to in other ways use such motion pictures as the "Snake Pit" which showed the condition of many state mental institutions? Are we going to take pictures out of *Life* and *Look* and spread them around that show the same things?

In other words, are we going to show what government hospitals are, what government medicine is? Are we going to show on the contrary what voluntary medicine is or are we going to above all tell these people they can have the finest of medical care if they are willing to put $10 or $12 into a fund every month; tell them what they will get, but they have got to pay for it and it can't be done for $2 or $3 or $3.50 and be done adequately.

Finally, are we ourselves going to supervise this public relations program? We can't all do it. We have a council and I think it is up to the council either to scan practically every piece of script, every club, everything that goes in, or to have committees or full-time employees of this association who will write and scan such scripts.

I fear I have talked too long, but I thank you. (Applause.)

VICE-SPEAKER CHARNOCK: Thank you, doctor.

We will continue debate on this status of "California Caravan," whether or not it is to be stopped on January 1, 1951, with the reservations by the committee. Is there any more discussion on "California Caravan"?

DR. DONALD: Mr. Speaker, and delegates of the California Medical Association: I have the budget proposed for next year of which $225,000 is put down into two items, department of public relations $150,000, public policy and legislation $75,000. That is $225,000, more than half of the total budget, and it is not broken down and there is no explanation of it.

Regarding the "California Caravan," may I say I am not attacking Dr. Cline or Whitaker & Baxter or any personal member of the council nor have I ever, regardless of Dr. Cline's insinuations. They have done a splendid job. We have had to advertise. We have done it through "California Caravan." It has been pure advertising.

My thesis is that if you will apply $89,000 to the salary of eight executive secretaries of the class that we have in nine counties, that you will do more for public relationship. It is beyond the time now for advertising. You have got to get down and guarantee to everybody in your community, physical care, whether they can pay for it full or part or not at all.

In Alameda County we have done that for two or three years. You can do it. You will get more good public relationship out of satisfaction with your physicians than you will with advertising, and that is the thesis of those of us who want to get ahead with the business that we have got to do and that is protect our patients, first, from lack of physicians' care, second, from overcharging, and that is the basis of Alameda County's work, and I think that such an article as that in *Nation's Business* is worth more than "California Caravan" for a year, and that is why I should like to see "California Caravan" discontinued as of now. Thank you. (Applause.)

DR. LESLIE MAGOON: My county is one that submitted a resolution recommending "California

Caravan" be discontinued. I believe our suggestion was not based on the merits of the program as a publicity medium. Your reference committee chairman pointed out to me very forcibly that I was incompetent to judge that since I admit to never having listened to that program. Our thesis is the same as Dr. Donald's, that for the same money spent in other ways, we can get much more in the way of return. It doesn't seem sensible to us that in a public relations budget of $150,000 over $90,000 or about $90,000 is paid for approximately a three-minute contact, once a week, with about 900,000 people.

I would venture that it is usually the same 900,000. To illustrate what I mean, in our county we have a public relations program that is mediated mostly through newspaper advertising. That program costs us annually about $2,000. At the same time the membership of our county spends about $3,300 for "California Caravan." We think that within the limits of our county as an area, we are getting much more for our $2,000 spent on our program than we are getting from the $3,300 we are spending for "California Caravan." It is a question of emphasis and of getting the most for your money.

We are prepared to accept the proposal of the reference committee which I believe is a reasonable compromise, that "California Caravan" not be stopped abruptly but be stopped as of January 1, unless two-thirds of the association is against it. I recommend the adoption of the reference committee's report. (Applause.)

VICE-SPEAKER CHARNOCK: Is there any more debate?

DR. SHIPMAN: I sense "California Caravan" may not be popular. Your council considered this matter rather exhaustively, and concluded that the report of the Budget Committee should be altered in certain respects.

The council was not unanimous either, any more than this house is, but when it was pointed out that actually the budget for "California Caravan" is included in the overall budget of Mr. Whitaker of Whitaker & Baxter, which is as follows, we changed our minds somewhat. That actual budget has not been presented to the council. It won't be until tomorrow morning, but I don't think I am violating any confidence by giving it to you now.

"California Caravan" radio program, $88,000.

Printing and mimeographing, $3,000.

Travel expense, $2,000.

Telephone and telegraph, miscellaneous expense, $2,000.

Whitaker & Baxter fee, $12,000.

Contingencies, $5,000.

Which brings it an overall figure of $112,000 which is the overall amount to be taken out of the $150,000 which you have heard mentioned.

It was the feeling of the council that inasmuch as the emphasis was to be shifted from C.P.S. to the overall medical program, our defense in Sacramento and in Washington was that "California Caravan" probably provided a worthwhile ace in the hole and we should have it; that all of us could probably afford $9, roughly $9 apiece in order to have an ace in the hole to defend us against adverse legislation.

As far as I am concerned, I would like to make it $90. (Applause.)

VICE-SPEAKER CHARNOCK: Dr. Truman, would you continue?

DR. TRUMAN: I might read briefly the part of the committee's report covering "California Caravan" and the item of the dues.

"Your committee recommends that this program be discontinued as of January 1, 1951, unless immediately prior to that time it is the consensus of two-thirds of the members of the council that it is essential to continue the radio program for a longer period in the interest of the overall public relations of the association. Upon the discontinuation of the present radio program, it is the recommendation of your committee that the unexpended balance in the public relations budget item be spent in more effective methods of public relations and publicity activities.

"Your committee believes that the budget as recommended by the committee includes sufficient funds to make money available on the vote of the council for public relations activities at the county level where such activities are considered to be beneficial for state-wide application.

"In their belief your committee recommends that no further action is necessary on Resolution 14 introduced by Dr. Leon Fox of Santa Clara County. The budget as recommended will be a balanced budget on the basis of dues for the calendar year 1951 reduced from $45 to $40 per active member and your committee recommends that the dues for 1951 be $40."

If it is not inappropriate at this time I will, therefore, move the adoption of this section of the committee's report.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded that we adopt this section of the report. Is there any debate? Are you ready for the question?

. . . The question was called for, the motion was put to a vote and it was carried. . . .

DR. TRUMAN: Mr. Speaker, I move the adoption of the committee's report as a whole.

A MEMBER: I second the motion.

VICE-SPEAKER CHARNOCK: It has been moved and seconded that we accept the report of Reference Committee No. 2 as a whole. Is there any debate on this? Are you ready for the question? Those who are in favor of accepting the report of Reference Committee No. 2 as a whole will signify by saying "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. TRUMAN: May I take thirty seconds to thank the members of the committee, Dr. Allen Hinman

and Dr. G. Wendell Olson for spending so much time. This is the first time that Committee No. 2 have ever had a large delegation of members of the house of delegates appear before it and it was quite an experience to have this happen. We appreciate very much the interest in the members of the house of delegates in the budget. Thank you. (Applause.)

VICE-SPEAKER CHARNOCK: Thank you, Dr. Truman.

At this time, the house of delegates will recess. The business session is to be taken over by California Physicians' Service.

. . . The house of delegates recessed to be followed by a meeting of California Physicians' Service. . . .

RECONVENING OF HOUSE OF DELEGATES
May 2, 1950

The meeting of the house of delegates reconvened and the speaker of the house, L. A. Alesen, presided.

SPEAKER ALESEN: The chair recognizes Dr. H. Clifford Loos, chairman of Committee No. 3.

REPORT OF REFERENCE COMMITTEE No. 3

DR. H. CLIFFORD LOOS: Reference Committee No. 3, consisting of Ivan C. Heron of San Francisco, Wesley Smith of San Diego and myself, has held hearings on the 23 resolutions presented to the house and various factors concerning the new constitution presented to you on Sunday evening and wishes to report that there was a large attendance at all hearings and ample opportunity was given to all those interested to participate in the discussions.

Resolution No. 1: Regarding by-law amendments.

The committee recommends that the by-law amendment to Chapter II, Section 2(b) be tabled for one year pending further clarification from the A.M.A., which we understand is under consideration. The second portion of Resolution No. 1, which is a by-law change regarding county secretaries' ability to collect dues, your committee recommends a "do pass."

Mr. Speaker, I move the adoption of this section of the report.

SPEAKER ALESEN: Dr. Loos, we have two items here. For the sake of clarity, we have to take them up one at a time. In the first place, there is no possibility of allowing other than a constitutional amendment to lie on the table. Any other resolution dies with this house as of this present session. Therefore, we will take up the proposed by-law amendment, the first one concerning the A.M.A. and the California Medical Association dues payments.

Is there any question in your minds about the content and the purport of that proposed change in the by-laws, or shall we read it? Do you all have copies?

The vote will be then, upon the adoption or the rejection of this proposed first change in the by-laws. This is an amendment to the by-laws, failure to pay dues. Do you wish further discussion, or are you ready to vote upon that now?

. . . The question was called for. . . .

SPEAKER ALESEN: All those in favor of the proposed by-law, signify by saying, "aye."

. . . The motion was put to a vote. . . .

SPEAKER ALESEN: The chair is in doubt. All those in favor signify by standing.

DR. MAGOON: Mr. Speaker, a point of order. If the chairman of the reference committee is not able to recommend it be tabled, may he be able to make a recommendation that it pass or not pass?

SPEAKER ALESEN: He may, sir. The present voting is still pending. It has not been announced. Therefore, we will allow the chairman to speak.

DR. LOOS: Mr. Speaker, I move that the first section of this resolution be voted "nay."

SPEAKER ALESEN: The recommendation of the committee is that the proposed by-law amendment be rejected. We shall put it in a positive sort of way then. All those in favor of this by-law amendment signify by saying, "aye."

. . . The motion was put to a vote and it was lost. . . .

SPEAKER ALESEN: Now, the second portion of this resolution, which is a by-law change regarding county secretaries' ability to collect dues. Your committee recommends a "do pass."

All those in favor of this by-law amendment signify by saying, "aye."

. . . The motion was put to a vote and it was unanimously carried. . . .

SPEAKER ALESEN: The vote being unanimous, it is declared that this vote is by more than a two-third majority. Therefore, the motion is passed.

DR. LOOS: Resolution No. 2: Regarding the closed panel system. Your committee recommends the adoption of this resolution.

Mr. Speaker, I move the adoption of this resolution.

SPEAKER ALESEN: Is there any discussion? All those in favor of the committee's recommendation signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. LOOS: Regarding a statement of policy of the California Society of Pathologists. Your committee recommends the adoption of this resolution. Mr. Speaker, I so move.

SPEAKER ALESEN: Is there any discussion? Is there a second?

A MEMBER: I second the motion.

SPEAKER ALESEN: All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. LOOS: Resolution No. 4: Regarding future industrial accident fee schedules. Your committee

favors the intent of the resolution but proposes one change in it, the deletion of the mandatory sixty-day requirement of notice to the county societies and substitution of a more flexible requirement to avoid tying the hands of the association for a fixed time interval. The amended resolution is as follows:

Resolved, That any future proposed fee schedule be placed before the component county medical societies and all interested and recognized specialty associations for their study, comment and approval preferably sixty days prior to submission to the Industrial Accident Commission for its final action.

Mr. Speaker, I move the adoption of the resolution as amended.

SPEAKER ALESEN: Is there a second?

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion?

DR. TRUMAN: I would like to suggest that if you mean specialists' associations that phrase includes the general practitioners; I think we should also have the opportunity to consider any amended fee schedules. I have this to suggest, that you make it clear that this includes the general practitioner organization.

SPEAKER ALESEN: You suggest that as an amendment?

DR. TRUMAN: Yes.

A MEMBER: The intent of the resolution was to include all groups.

SPEAKER ALESEN: Well, the chair will rule that is the intent of the resolution and the phraseology will be changed so as to include that. Is there any further discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. LOOS: Resolution No. 5 and No. 6: Regarding C.P.S. fees. These resolutions deal with the same general subject, therefore the committee has combined them into one substitute resolution as follows:

Resolved, That the house of delegates requests the board of trustees of C.P.S. at all times to bear in mind and endeavor to carry out the basic principle that dues charged the public shall be adequate to permit payment of the fee schedule in full rather than at a discount and that in issuing any new types of contracts that it use extreme care to insure as far as humanly possible that the rates charged the public will be adequate to meet the rates in full.

Mr. Speaker, I move the adoption of the foregoing substitute resolution.

SPEAKER ALESEN: Is there any discussion?

DR. HODGES: First of all, I am a general practitioner, and I do not believe in the drawing of any battle lines between specialists and general practitioners in anything and in particular California Physicians' fee schedules. Regarding the adoption of these resolutions, I felt that it was rather timely to introduce a resolution now because of the fact that a new type of coverage, the catastrophic illness coverage, is coming in and this should represent something. This should represent a time at which we could take a new approach toward a realistic fee schedule.

I feel in particular that any such far-reaching plans as a catastrophic illness coverage should be submitted sufficiently early to the professional members of the California Medical Association so that the study of them and consideration could be given in advance.

DR. MAGOON: Mr. Speaker and members of the house: The proposals of this resolution are exactly contrary to the proposals of a resolution that we discussed as administrative members, and that was that the C.P.S. fee schedule, because of its use as a yardstick by the public for all our fees, should be set at a level representing fair private fees, and that we should allow for the fact that our clientele is in a low income group, by discounting those fees certain proportions as experience demonstrates is possible.

On those grounds I would be opposed to the resolution as proposed.

SPEAKER ALESEN: Is there any further discussion?

DR. DAVIS: I would just like to point out from here that this resolution applies to the fees charged the beneficiary members. It does not refer to the rate paid to the doctor.

SPEAKER ALESEN: Is there further discussion? Are you ready for the question?

. . . The question was called for. . . .

SPEAKER ALESEN: All in favor signify by saying, "aye."

. . . The motion was put to a vote. . . .

SPEAKER ALESEN: The chair is in doubt. All those in favor will signify by standing.

DR. TRUMAN: May we have some clarification?

SPEAKER ALESEN: Yes, Dr. Truman.

Be seated for a moment, please. Dr. Truman.

DR. TRUMAN: It seems to me that clarification is necessary here. You are asking that the rate charged the public be made adequate to meet rates in full, and there are two separate things there. Are you going to ask for payment of rates in full or are you going to ask the rates that the customer pay be raised to meet the rates in full?

SPEAKER ALESEN: Dr. Loos, do you want to answer that, or Dr. Hodges?

DR. LOOS: I think it is quite clear here that the principle is that the fee charged the public shall be adequate to permit payment of the fee schedule in full rather than at a discount, and the intent is that in all contracts that are issued hereafter that the premium rate be sufficiently high to pay the doctor his full charge according to the fee schedule adopted, instead of a percentage of it. That is all new contracts are to be written so the premium should be higher than what it is in the old contracts.

SPEAKER ALESEN: Are you now ready to vote

upon this resolution? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The ayes have it. The resolution is adopted. Proceed, Dr. Loos.

DR. LOOS: Resolution No. 7: Regarding a study of medical and hospital prepayment plans. The committee favors the intent of this resolution; however, probably inadvertently it is limited to medical or hospital service "corporations." A number of prepayment plans are otherwise organized and therefore the committee recommends the deletion of the word "corporation" and the substitution of the word "organization" and as so amended recommends the adoption of the resolution.

Mr. Speaker, I move the adoption of this section of the report.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. LOOS: Resolution No. 8: Regarding indemnity insurance policies. Your committee recommends that, due to the complexity of this resolution, it be referred to the council of the California Medical Association for final action and not be acted upon by the house.

Mr. Speaker, I move the adoption of this section of the report.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion?

DR. MONTGOMERY: I bow to Dr. Parker who wishes to speak first.

SPEAKER ALESEN: Dr. Parker.

DR. PARKER: Mr. Speaker, this resolution which has to do with indemnifying insurance is mainly to be handled by the council and if we had some assurance that the council will make a study on it we could turn it over there. But will your recommendation of your report be turned over to the council and reported back to us?

DR. LOOS: That is right, yes.

SPEAKER ALESEN: Dr. Montgomery, did you wish to discuss this?

DR. MONTGOMERY: I think that covers the point.

SPEAKER ALESEN: Is there further discussion?

. . . The question was called for. . . .

SPEAKER ALESEN: All in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered.

DR. LOOS: Resolution No. 9: Regarding medical care for the armed services. The committee recommends the adoption of this resolution and so moves, Mr. Speaker.

Mr. Speaker, I move the adoption of this section of the report.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered.

DR. LOOS: Resolution No. 10: Regarding fee schedule committees. Your committee favors the general purposes embodied in this resolution as presented to the house but because this house cannot order or direct any corporate function of C.P.S. or any committee of C.P.S. it was felt necessary to reword the resolution, which your committee has done. The amended resolution is as follows:

Resolved, That the present industrial accident fee schedule committee of the C.M.A. and the C.P.S. Fee Schedule Committee should be replaced by a single fee schedule committee as representative as possible of general practice and the specialties with subcommittees if necessary, members to be appointed for three-year terms initially on a staggered basis for continuity of personnel; and, be it further

Resolved, That until a single fee schedule committee is in effect all existing committees of the C.M.A. and C.P.S. dealing with fee schedules should integrate their work, pool all facts and data and endeavor to reach uniformity of result; and, be it further

Resolved, That all fee schedule committees ought to prepare and maintain by revision as required, a schedule of average fees in California without any minimum or maximum implication; and, be it further

Resolved, That any reduction in the schedule should be granted with emphasis on the fact that such reduction is a concession on the part of the medical profession; and, be it further

Resolved, That such committees should report to the house of delegates and the C.P.S. administrative members at each annual meeting and at any interim meeting.

Mr. Speaker, I move the adoption of the substitute resolution.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion on this resolution? All in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The resolution is adopted.

DR. LOOS: Resolution No. 11: Regarding civilian disaster committee. We recommend the adoption of this resolution as amended, as follows:

Now therefore be it Resolved, That the Governor of the State of California be respectfully petitioned to appoint the chairman of the C.M.A. Committee on Emergency Medical Service to the California State Disaster Council.

Mr. Speaker, I move the adoption of the amended resolution.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is adopted.

DR. LOOS: Resolution No. 12: Regarding the Benevolence Fund. The constitution requires that one dollar of the annual dues paid by each member be allocated to the physicians' benevolence fund and the by-laws require that the standing Committee on Physicians' Benevolence carry on a program of aid to needy members with the special fund allocated by the constitution. This resolution is in conflict with both the constitution and the by-laws and if acted upon by the house could not accomplish any purpose. For this reason the committee recommends that the resolution do not pass.

I move the adoption of this section of the report.

A MEMBER: I second the motion.

SPEAKER ALESEN: The action now is upon the adoption of the committee's report which recommends the rejection of the resolution. Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The committee's report is adopted. The resolution is rejected. Proceed, Dr. Loos.

DR. LOOS: Resolutions No. 13 and 15: Regarding "California Caravan." Inasmuch as Resolutions Nos. 13 and 15 referring to the "California Caravan" have already been acted upon by the house through the reports of Reference Committee No. 2, your committee feels further action is unnecessary. I recommend that Resolutions No. 13 and 15 be tabled. I so move.

These have already been acted upon by the house, so I think they will be tabled.

A MEMBER: I second the motion.

SPEAKER ALESEN: There is no point in tabling these. These resolutions must die as explained before. No action is necessary. Proceed, Dr. Loos.

DR. LOOS: Resolution No. 14: This resolution was referred to Reference Committee No. 2.

Resolution No. 16: Regarding student liaison. It was the consensus of the committee that anything that can be done to familiarize the students with the practice of medicine was good. However, due to the technical difficulties involved and the lack of available time at present to work out the problems involved, we recommend that this resolution be referred to the council for final action. I move the adoption of this section of the report.

DR. DAVIS: I am happy to see the committee was unanimous in feeling that this was a good idea. However, they seem to be a little bit confused about technical difficulties, and I would like to refer you to page 7 of the resolutions as they were originally introduced, particularly the resolved portions of Resolution No. 16 in which there does not seem to be anything very confusing or any technical difficulties.

The resolved portions said,

"*Resolved*, That the house of delegates of C.M.A. suggests to the managerial board of CALIFORNIA MEDICINE that the prepayment of subscriptions to CALIFORNIA MEDICINE for all medical students, interns and residents within California would have many worthwhile benefits in relation with students of medicine; and, be it further

"*Resolved*, That the managerial board be requested to contact the agencies whose cooperation might well be enlisted to attain this effect."

This is a suggestion. There is nothing compulsory about it. It is an attempt to get some action started, to enable the practicing physicians of the state to become acquainted with the interns and medical students and establish some rapport.

I see no reason in the world why there should be any technical difficulties in getting into effect a suggestion and a request.

SPEAKER ALESEN: The motion is on the committee's recommendation that the resolution be referred to the council. Is there any further discussion?

. . . The question was called for. . . .

SPEAKER ALESEN: The chair is in doubt about the vote. The vote will, therefore, not be determined.

DR. SMITH: Mr. Chairman, the technical difficulties are not those of the committee or of the council but the necessary research that will be necessary regarding postal regulations and the control and the ability to send this magazine. You asked as a suggestion to refer to the council, and this sends it to the council.

DR. DAVIS: Why should this not mean refer to the managerial board with the suggestion that it be done as the original resolution requests?

DR. SMITH: It is.

DR. DAVIS: But you want to refer to the council.

SPEAKER ALESEN: Gentlemen, in the interest of decorum, will you please take the microphone and address the chair, not the speaker?

DR. DAVIS: My point is this: That the house of delegates contact the managerial board of the magazine and suggest that certain things be done, implies that they be done if feasible. We certainly don't expect them to do anything in violation of federal statutes or go to any great length to do something that is totally impracticable. They are requested to put this into effect and contact agencies which might cooperate if necessary. I see no reason why the council should have to go through the entire argument and then request the managerial board to go ahead and start doing something about it. It seems like needless delay.

SPEAKER ALESEN: Is there further discussion? Dr. Loos, do you want to discuss this?

DR. LOOS: Just to this extent. The technical difficulties as Dr. Smith stated, were not those of our committee. There was much discussion on this measure before the committee and many wonderful

ideas were evolved. I believe that there were three to five thousand students and interns that would be involved in this thing which would mean an expense of getting the magazine into the hands of each one of those people.

It was suggested by some that a section of the CALIFORNIA MEDICINE magazine be devoted to interns and students, that a section be incorporated in that. It was also unknown to us about postal laws, whether we could give this magazine away and get it through our second class mail matter. Those things had to be investigated.

Now there is no managerial board of the California Medical Association that I know of. There may be, but I don't know of any. The council is the board of managers, if you wish to call them that. Mr. Hunton is the so-called business manager, if you wish to call him that, but there is no special board to which the council or house of delegates could refer this matter as far as I know, and I think that the matter if it is laid before the council, we will get quicker action than any other way we can do it, and this resolution so advises the council.

. . . The question was called for. . . .

SPEAKER ALESEN: Are you ready for the question? You are voting now on the committee's recommendation to refer the matter to the council. All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered.

DR. LOOS: Resolution No. 17: Regarding non-medical administration of hospitals. We recommend that this resolution do pass.

SPEAKER ALESEN: Is there a second?

A MEMBER: What is the resolution?

DR. LOOS: Do you want the resolve? It is, "That this house of delegates of the California Medical Association express its disapproval of those hospital administrations and lay organizations which invade this field of activity; and be it further

Resolved, That a copy of this resolution be sent to each hospital administrator within the State of California."

SPEAKER ALESEN: Is there a second?

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there discussion?

DR. BALL: Yes, I would like to discuss that, sir.

SPEAKER ALESEN: Dr. Ball!

DR. BALL: Mr. Speaker, gentlemen: There are in existence today some eight or ten universities of good standing who are training hospital executives. They are non-medical. They are astute. They are carefully selected. They are away from the medical problems. In the majority of cases they are sympathetic.

I think our resolution is out of order in view of the talent available for hospital management. I would like to urge you to reject the resolution.

SPEAKER ALESEN: Is there further discussion on this resolution? Are you ready for the question? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered.

DR. LOOS: Resolution No. 18: Regarding oath of office. The committee has amended this resolution to read as follows:

Resolved, That Section 9 is hereby added to Chapter VI of the by-laws of this association, California Medical Association, to read as follows:

"Section 9—Oath of Office

"All officers and employees of the association, upon election or appointment, shall subscribe to an oath or affirmation as follows: 'I do not belong and have not belonged to any organization advocating the overthrow or change of the form of government of the U.S.A. by violent or unlawful means nor do I believe in changing the form of government of the U.S.A. by violent or unlawful means.' If, after full hearing, the council shall find that an officer or employee falsely subscribed to the oath or affirmation, it may in its discretion remove the officer or employee from his office or position and fill the vacancy so created."

Mr. Speaker, I move the adoption of this amended resolution.

I move the adoption of this section of the report.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there any discussion?

. . . The question was called for. . . .

SPEAKER ALESEN: All those in favor of this proposed by-law amendment signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The vote appearing unanimous, it is adopted by more than two-thirds majority. Proceed.

DR. LOOS: Resolution No. 19, regarding recognition of ethical psychologists. Your committee recommends the adoption of this resolution. I so move.

A MEMBER: I second the motion.

SPEAKER ALESEN: Any discussion? All in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is adopted.

DR. LOOS: Resolution No. 20. Regarding resolution on medical practice in hospitals. Your committee recommends the adoption of this resolution. I so move.

SPEAKER ALESEN: Is there a second?

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

DR. LOOS: Resolution No. 21 has already been discussed. The speaker advises me this can be

thrown out. The same refers to Resolution No. 22. It has already been discussed and acted upon.

Resolution No. 23: Regarding correlation of hospital inspection. With permission of the sponsor, a substitute resolution is presented, as follows:

Resolved, That the C.M.A. delegates to the A.M.A. be requested to introduce in the A.M.A. house of delegates the following resolution or, in their judgment, a similar one:

WHEREAS, We have been unofficially informed that the A.M.A., the A.C.S. and the American Board of Surgery have finally agreed upon a unified service of hospital inspection and approval for graduate training in general surgery; and

WHEREAS, This step has been long overdue and it is to be hoped that further steps will follow more promptly for correction of the present intolerable system of bureaucratic dictation of graduate training; now, therefore, be it

Resolved, 1. That the Advisory Council on Medical Specialties, be instructed to authorize no more new specialty boards without specific approval by this house of delegates.

(That refers to the A.M.A. house of delegates, by the way.)

2. That the Council on Medical Education and Hospitals be instructed to offer with adequate publicity in the journal, to extend its unified inspection service to include the other specialties concerned in hospital graduate training programs.

3. The present dictation of graduate training programs by multiple specialty boards responsible to no single coordinating authority is intolerable. The A.M.A. through its councils should never have lost this authority and its officers are hereby directed to regain it (by steps that will be quite obvious) to the end that (a) more reasonable and less rigid training programs be agreed upon, (b) that rigid limitations of practice be abandoned, and (c) that other much needed reforms be adopted.

Mr. Speaker, I move the adoption of this substitute resolution.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is adopted.

DR. LOOS: Resolution No. 24. By-laws change regarding qualification of delegates. The committee suggests amending the resolution as introduced to insure that any delegate rejected by the Credentials Committee shall have the right to appeal to the house. The resolution as amended is as follows:

Resolved, That Subdivision (d) of Section 6 of Chapter III of the by-laws of this association, California Medical Association, is hereby amended by adding to said sub-section (b) at the end thereof a new paragraph reading as follows:

"The Committee on Credentials shall require each delegate and alternate and other active member of a component county society who desires to be seated as a member of the house of delegates, to subscribe under oath and in such form as shall be determined by the Credentials Committee, that he is not and has not been at any time a member of any organization listed, published or held to be subversive by the Department of Justice of the United States of America. In the event of refusal to subscribe to such oath, the Credentials Committee may not include such person in its written report to the house of delegates designating the delegates and alternates entitled to membership therein. Any person refused a seat by action of the Credentials Committee shall have the right to appeal to the house and by majority vote the house may overrule the Credentials Committee and seat such person as a delegate."

Mr. Speaker, I move the adoption of the resolution as amended.

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there discussion?

DR. MAGOON: Mr. Speaker and members of the house: I am opposed to the words, "and has not been at any time," as being too inclusive. I believe it is possible to have belonged to an organization that later was declared to be subversive without at the time knowing that you did so. I think it is sufficient to require that a member specify that he is not now a member of such an organization.

A MEMBER: I second the motion.

DR. WOODWARD: Mr. Speaker, in discussing the amendment proposed by Dr. Magoon, I feel it is extremely important that this resolution be delicate enough to detect all possible subversive individuals and the like, even though we do catch in our net some who at that time are not subversive. Those who are not dangerous to us are not actually subversive and have only been members of such organizations inadvertently can be seated by the house of delegates by a majority vote and having that right of appeal we have also a specific test that will get us the proper delegates.

SPEAKER ALESEN: Is there further discussion on the Magoon amendment?

DR. ALSBERGE: As I sense no feeling in this house that this resolution is not necessary; as I feel that this house realizes that this type of resolution is necessary, I should like to speak to Dr. Magoon's amendment.

In adopting this amendment, gentlemen, you will pull the teeth from the resolution without furnishing any dentures to take their place. It is absolutely impossible with this amendment to fulfill the wish or purpose of the resolution, because all that a man would have to do would be to resign one day and accept his appointment here the next. That is what they are instructed to, and that is what they always do.

We have rather a serious situation in the making. This is for the purpose of forestalling that situation. As far as safeguards are concerned, gentlemen, if a man takes the oath, that is all there is to it. If he does not, if I understand the mechanics of it cor-

rectly, if he refuses to take the oath for a reason and because he belonged to a subversive organization in the past, he reports to the Credentials Committee; the Credentials Committee would weigh his reason therefor and then the matter would be referred to the house of delegates with a recommendation from that committee.

I have no doubt in my mind that on this subject the Credentials Committee will leave the benefit of the doubt in favor of the individual. I am sure that this body is not and will never engage in a witch hunt, but this body must protect itself and this amendment will keep it from doing that.

The resolution if passed as is, will keep this house safe.

DR. DE LOS REYES: Mr. Chairman, I am the father and mother of this resolution. Gentlemen, we have a great danger, and we all admit it, as to what Dr. Magoon brought up here. You have to be sure of this thing and the courts of the United States have ruled that if a man has ever belonged to any organization who later became subversive and that man takes an oath he was not a member of such organization, he is correct because at the time he first joined it was not a subversive organization, and therefore he is not in danger of being called a subversive or his record being smeared and besmirched. I think it is necessary for all of us to be confident.

I agree with Dr. Alsberge. The moment we go ahead and accept an amendment, with the utmost respect for Les, we are going to take out the teeth and it is going to be worthless.

If we are going to be on the front line and fight the battle for so-called Americanism, then we should be the first ones to take the oath and be glad we have taken it.

DR. MAGOON: Mr. Speaker, may I have permission to withdraw my amendment?

SPEAKER ALESEN: Who was the seconder of Dr. Magoon's amendment?

A MEMBER: Nobody.

SPEAKER ALESEN: Is there any objection to Dr. Magoon's request that he withdraw the amendment?

. . . There were cries of "No." . . .

SPEAKER ALESEN: If not, the amendment is withdrawn.

Dr. Carson.

DR. CARSON (San Francisco): I would like to offer an amendment to this resolution as offered. In its present form I do not like it at all for two reasons: Time is very long. Some of these organizations that are held subversive now were not subversive some time back. Some organizations that now are not in bad standing may be odorific by 1953. The other point is that the Attorney General, that is the head of the Department of Justice of the United States Government, is of necessity a political officer. Now, all of us in this room dread the coming of the welfare state which means having everything in the hands of the government. We don't know what sort of an Attorney General we may have at any time, and what attitude he might take.

Therefore, I think that we are laying ourselves wide open by adopting this resolution in its present form, and I would like to offer the following amendment: Namely, that "the Committee on Credentials shall require each delegate and alternate and other active members of the component county societies who desire to be seated as members of the house of delegates, to subscribe under oath an affirmation at this time for them to take the same oath as has been adopted tonight in resolution No. 18, referring to the oath of office for an officer of this organization."

A MEMBER: I second the motion.

SPEAKER ALESEN: Dr. Carson's motion and proposed amendment has been seconded. Is there any discussion?

DR. ALSBERGE: Mr. Speaker, a point of order.

SPEAKER ALESEN: State your point.

DR. ALSBERGE: As delegates, are we not officers of the association?

SPEAKER ALESEN: Will the legal counsel rule on that, please. I believe not.

DR. ALSBERGE: If so, it would be superfluous.

SPEAKER ALESEN: I believe not, doctor. I believe the officers are classified a little differently. Just a moment.

MR. HASSARD: Mr. Speaker, according to the constitution the following are the officers of this association: President, president-elect, secretary-treasurer, speaker, vice-speaker, and editor, and 15 councilors. So the delegates are not officers.

SPEAKER ALESEN: Proceed, Dr. Alsberge.

DR. ALSBERGE: I had hoped not to have to speak at any greater length because the hour was late. However, I find that at least to my way of thinking it is necessary to do so. This amendment would apply only to a proven member of the appeal called the Foley Square or the appeal on the eleven Communist leaders in the United States as to whether or not even they are advocating the overthrow of the government by force and violence. Unfortunately the previous resolution did not contain this.

If this amendment is passed you will be able to carry out your intent against no individual unless you can prove that he is a member of the Communist party because that has been the only one, so designated by the courts, on the left-wing that advocates overthrow of the government by force and violence. The others do the work of the Communists but they are not classified as organizations advocating the overthrow of the Government by force and violence.

In Los Angeles we do have some queer characters. (Laughter.) I think a little background is in order. I am from Los Angeles. I shall try and make my remarks brief, but give you that background.

Last fall in a county election in Los Angeles while I was present with a number of members here, a doctor, a member of our association, stood up and nominated another man to run for office. For-

tunately two of us recognized him with his background. I shall now give you the background of these individuals, and the present resolution would stop none of them.

The doctor who was nominated for the council of the Los Angeles County Medical Association, was sponsor of Leo Gallagher for office of secretary of state on the Democratic ticket in the 1938 California elections; signer of a protest demanding the release of ten Los Angeles Communist leaders jailed for contempt of the Federal Court; sender of eleventh anniversary greetings to the *People's World*; advertiser in the *People's World* when he sent 1949 May Day greetings.

Now the doctor who nominated him was a signer of a protest against the arrest of ten Los Angeles Communist party leaders, signer of a letter to halt extradition of Wiley King, a Communist cause celèbre; member of the reception committee for Max Steinberg, executive director of the notorious Communist front, the American Jewish Labor Council; member of the medical panel of Hollywood Arts, Sciences and Professions Council, a major Stalinist organization; speaker at meetings of the Communist-run Independent Progressive party; signer of Civil Rights Congress petitions. The CRC is the organization currently raising funds for the defense of the eleven convicted national CP leaders.

Backers of this particular doctor include men with this type of record. One doctor in Los Angeles who backed them was sponsor of the Los Angeles Emergency Committee to aid the strikers, a Stalinist-front organization. In 1944 he was in the People's Educational Center in Los Angeles. He was a signer of a brief to the United States Supreme Court in support of John Howard Lawson and Dalton Trumbo, two of the "Hollywood Ten." He protested against the arrest of the eleven Communists in Los Angeles; associated with the California Labor School, Los Angeles branch; sponsored an appearance of Paul Robeson in Los Angeles last September, and a very active member of the Hollywood Independent Citizens Committee of the Arts, Sciences and Professions; active in the American-Soviet Medical Society.

A few of these organizations, gentlemen—all of these organizations do contain innocent individuals; let us remember that. But it is rather hard for me to conceive an innocent individual will join this many front organizations.

Just about two weeks ago he again appeared in the Communist newspaper, the *People's World*, at which time he was quoted as signing a letter to the Attorney General, demanding the immediate dropping of prosecution of the ten Communist leaders in the United States.

I do not intend to give you a detailed discussion of Communism. I could talk for quite some time, several hours, gentlemen, about men that we have, members of our association, who have these ideologies. They made their first attempt and they were only defeated because of the fact that one man nominating him was recognized. Next time they will be smarter. They will send somebody we don't know, and there are plenty of them.

Now the thing I want to drive home is this: That this information was sent out in great detail to every member of the Los Angeles County Medical Association. For reasons that I have heard expressed before the reference committee and elsewhere, because of a fear of infringement upon a person's liberty or for some other reason—and we must not infringe upon those liberties—we must not lose sight of the fact we must protect our way of life and we must think, what will the alternative be?

Then I wish to add that with this information in the hands of every member of the association who was on the mailing list—at least they were mailed—one of the candidates received 20.2 per cent vote and the other in excess of seventeen. I do not wish, gentlemen, these men to be on the floor of the house of delegates using it as a springboard for the publicizing of the briefs of the Stalinists and their organizations.

They cannot be stopped by having to prove that they are members of the Communist party, for two reasons. One, it took a good part of a year and a few hundred thousand dollars or more to convict the eleven leaders of the Communist party, and secondly, the only way you can convict a Communist of being a member of the party, because they no longer carry cards, gentlemen, and have not for some time—the only way that can possibly be done is to find a Communist, an ex-Communist and then have him testify against the man you say is a Communist. Then they immediately call him a stool pigeon and a great portion of the American public, with their fuzzy thinking on the subject, rise and shout, "Slander."

Gentlemen, I move this amendment be defeated.

A MEMBER: I second the motion.

SPEAKER ALESEN: Just a minute. Of course, that motion is out of order. The debate is on Dr. Carson's amendment. Further discussion is out of order.

DR. FAGIN: Gentlemen, I am a neophyte in this organization, and I don't know very much about state medical policy, but I do know this much: That up at Berkeley we had quite a big controversy recently about just such a situation, and the public relations in regard to that were terrible.

Now I don't think that the state medical society in its attempt now to establish good public relations can afford to get involved in a controversy of this sort. The San Francisco *Chronicle* which was mentioned before as coming out in favor of voluntary health insurance, came out very bitterly against this oath, and they came out against it for several reasons, but the main reason was that it didn't get the Communists because they sign it anyway.

It didn't get reactionary average persons but it got liberal individuals whose consciences would not permit them to sign such an oath.

Now we are smart enough to know who are

Communists, and it is enough for us to say, "Is a man a Communist, or is he not a Communist," but to undertake the amount of suspicion that this oath will start, the gathering of physicians, the attempt of one man to malign another in order to get office by saying perhaps he belonged to this organization or perhaps he belonged to that, is wrong. Medicine must build more stately mansions. Medicine must not get involved in this hysteria.

I would like to second the amendment that was just made. (Applause.)

DR. DE LOS REYES: I am sorry, fellows, but I have to speak again.

J. Edgar Hoover said that it is impossible for anyone to say who is a Communist. I would like to know who they are. I attend a lot of the meetings trying to find out who they are. I have never been able to detect one of them.

I am probably the only member of this association that is an American by choice and not by accident of birth, and I have seen totalitarian governments, and I have seen socialism and Communism and I have seen their infiltration, how they got control of different bodies, and this is a thinking body. This is a body that can go ahead through its members and perhaps more people in the United States than any other organization we know of, and we cannot go ahead and allow this amendment to go through. Otherwise the resolution is worthless.

By the way, we in Los Angeles are not the only queer people. In San Francisco they have them also. Several years ago, as one of the executive officers of one of the national fraternities, it was my duty to go there and remove the charter of one of the national medical fraternities. Why? Because fourteen of the men that were there, seven of them seniors, were members of the Communist party, and although we couldn't prove it, their attitude and their records and their actions proved so.

One was the brother of the secretary of the Communist party in San Francisco, a man that had come here as a refugee, or the son of a refugee, and paid for the protection that was given in this country by trying to undermine it.

Please, fellows, let's think carefully about this and let's pass this resolution. (Applause.)

SPEAKER ALESEN: Is there further discussion on Dr. Carson's amendment?

DR. BAILEY: A point of information from Dr. Loos. I don't quite understand why in his committee he didn't amalgamate these resolutions 18 and resolution 24. I don't think there are any among the officers that belong to the Red Guard, but it looks like there is a chance here.

DR. LOOS: Dr. Bailey, that is a technical point, and there is a difference between them, and I am going to ask our legal advisor to explain the difference between those two.

MR. HASSARD: The by-laws contain in one chapter the qualifications of being an officer of the association, and in a separate chapter, some pages farther away, the qualifications of being a delegate. It was necessary to amend sections in both chapters and it would have been more confusing if you had tried to do it in one than in two.

Secondly, while the delegates are not officers and the delegates would only be bound by the resolution that is before you now, if you adopted it, the officers on the other hand are delegates. Therefore, the officers will be bound by this resolution as well as by the prior one that you have already adopted.

. . . There were calls for question. . . .

SPEAKER ALESEN: Are you ready to vote on the amendment?

SECRETARY GARLAND: May I have the floor?

SPEAKER ALESEN: Yes, Dr. Garland.

SECRETARY GARLAND: I happen to be one of those people that Dr. de los Reyes referred to as a somewhat displaced person, a person who has adopted this country and who has had the privilege of serving in the Navy in the last war for three and a half years and proposes to serve again in the next war if he is accepted.

Nevertheless, I agree with the speaker in the back of the hall. The intent of the motion is excellent. The elimination of Communism from our midst will not be achieved by it. It will be thought of as being equally hysterical with those in other parts of the country who are striving to solve our different ideological problems by this method. I don't think it is dignified. I don't think it is worthy of the medical profession.

I move you, Mr. Speaker, an amendment to the amendment to lay this matter on the table.

A MEMBER: I second the motion.

SPEAKER ALESEN: Dr. Garland, what in effect you want to do is kill the entire proposed amendment. It would be impossible merely to move to lay the proposed amendment of the amendment on the table because the amendment is a subsidiary motion. Do you wish to apply the motion to table to the entire matter and not to Dr. Carson's amendment?

SECRETARY GARLAND: Yes, sir.

SPEAKER ALESEN: That is possible, but the chair points out that if you adopt Dr. Garland's motion, you are in effect killing the entire proposed by-law amendment, because it must necessarily die with this present meeting of this session if action is not taken.

This is not debatable. Is there a second?

A MEMBER: I second the motion.

SPEAKER ALESEN: All right. The motion is to lay the entire amendment, not the amendment to the amendment, but the entire proposed by-laws amendment on the table. Are you ready for the question?

. . . The question was called for, the motion was put to a vote and it was lost. . . .

SPEAKER ALESEN: We now recur to a discussion of Dr. Carson's motion.

Dr. Doughty appeals to a decision through the

chair. All those in favor of sustaining the chair signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The chair is sustained.

We recur to a consideration of Dr. Carson's amendment.

SECRETARY GARLAND: Mr. Speaker, a point of order. I think the members of the house were somewhat confused by that last motion.

. . . There were cries of "No." . . .

SPEAKER ALESEN: It is the speaker's belief to the best of his knowledge and ability that the present pending question is that of Dr. Carson's amendment to the proposed amendment of the by-laws. That is to change certain phraseology. Do you wish certain discussion on that point?

DR. CRANE: Mr. Chairman, notwithstanding all that has been said this evening, I don't believe there is an officer or a member in this house of delegates that should refuse at any time to take allegiance to this country in any way, shape or form, and I ask you to defeat this amendment. (Applause.)

DR. ASKEY: Mr. Speaker, I think we are getting pretty well heated up about this thing, and if I weren't heated up about it, I wouldn't get up, because I promised myself I wasn't going to bother you any more.

Ladies and gentlemen, when a question is raised of this type, we are in a peculiar position. I am afraid Harry Garland may be misunderstood. I love Harry Garland. He is just as great a patriot as you or I or anybody else. He thinks it is silly to ask patriots of this type to say this thing and that is why he said it, I am sure, not because he doesn't believe in America. However, the question has been raised. Now listen, gentlemen, if my wife asked me tonight if I still loved her, I am a damned fool if I am not happy to say that I do, and I will be happy to tell her every time she asks me, and if I am afraid to tell her that and refuse to answer, she would be entitled to divorce me and kick me out.

The same thing holds for this. If I am ever ashamed to say I am in favor of the United States of America and never intended to be otherwise, I intend to be kicked out, and therefore, I hope you defeat this resolution. (Applause.)

SPEAKER ALESEN: Are you ready to vote on the Carson amendment?

. . . The question was called for. . . .

SPEAKER ALESEN: All those in favor of Dr. Carson's amendment signify by saying, "aye."

. . . The motion was put to a vote and it was lost. . . .

SPEAKER ALESEN: The amendment is lost. You now recur to a consideration of the proposed by-law as originally presented. Is there further discussion on that?

. . . The question was called for. . . .

SPEAKER ALESEN: All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered. Dr. Loos, proceed.

DR. LOOS: Proposed new constitution. Your reference committee introduced at the Sunday evening meeting an entire new constitution which must lie on the table until the 1951 meeting. However, your committee desires to add a subsection (d) to Section 1 of Article III, Part A, reading as follows:

"(d) Ex-officio without the right to vote, the past presidents."

Mr. Speaker, I ask permission to incorporate this addition in the proposed new constitution pending before the house.

SPEAKER ALESEN: Is there any objection to this proposal of Dr. Loos?

DR. J. E. YOUNG (Fresno): Mr. Speaker, a point of information.

SPEAKER ALESEN: State your point.

DR. YOUNG: Is this the place to submit new amendments?

SPEAKER ALESEN: Yes, right now.

DR. YOUNG: May I submit some, Mr. Chairman?

SPEAKER ALESEN: If you have them ready and typed in final form, yes, sir.

Wait a minute. These are amendments for the constitution you are proposing, Dr. Young?

DR. YOUNG: Yes, sir.

SPEAKER ALESEN: And they are in final form?

DR. YOUNG: Yes, sir.

SPEAKER ALESEN: It is in order, yes.

Wait just a minute. We have got a motion before the house.

Is there any discussion on Dr. Loos' proposal? Is there a second to Dr. Loos' final proposal to add this other clause to the constitution to lie on the table? Are you clear what we are talking about?

A MEMBER: I second the motion.

SPEAKER ALESEN: All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: The motion wasn't actually needed because any member may introduce a constitutional amendment if he wants to. Let's finish Dr. Loos' report.

DR. LOOS: Mr. Speaker, I move the adoption of this report as a whole as amended.

A MEMBER: I second the motion.

SPEAKER ALESEN: It has been moved and seconded that the report of the reference committee No. 3 be approved as amended. Is there any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Now, Dr. Young, is it going

to take considerable time? Are you going to read them?

DR. YOUNG: No, sir, Mr. Chairman. They are very short.

SPEAKER ALESEN: Proceed. Otherwise we could present them to the secretary.

DR. YOUNG: I can do that, Mr. Chairman. I can give you the title. I propose as an amendment of the proposed constitution of Section 4, Article IV, under the heading of Special Assessments. Mr. Chairman, I propose also a constitutional amendment to the proposed new constitution, of Section 9, Part B of Article III, namely, the composition of the council, and redistribution of the state according to councilor districts.

SPEAKER ALESEN: Will you place those documents in the hands of the secretary? No action of the house is taken at this time.

. . . The documents that were placed in the hands of the secretary are as follows:

Resolved, That Section 4 of Article IV of the constitution of this association, is hereby amended to read as follows:

Section 4, Special assessments, etc.

Funds may be raised by any of the following methods: (a) publications of the association; (b) voluntary contributions, (c) bequests, legacies, devises and gifts, (d) special assessments levied by the house and (e) in any other manner approved by the house. In the event that the house levies any special assessment or other assessment than the annual dues, it may, in the resolution levying the assessment, fix and determine the time within which such assessment may be paid and the class or classes of members upon whom it is levied.

The penalty for failure to pay such assessment shall be levied by the local society.

* * *

Resolved, That Section 9, Part B of Article III of the revised constitution of this association be amended as follows:

"Section 9, Composition.

"The council shall consists of:

"(a) Sixteen district councilors elected from the councilor districts specified in this constitution; and

"(b) Four councilors-at-large elected by the house of delegates, and

"(c) The president, president-elect, and speaker.

"In addition, the secretary-treasurer and editor, ex officio, but without the right to vote."

And that Section 10, Part B of Article III be amended as follows:

"Section 10, Councilor districts.

"(a) The state shall be divided into sixteen councilor districts according to economic and geographic lines. This division is to be effected by the council.

"(b) The state shall be reapportioned at least every five years or oftener if needed by the council.

"(c) The geographical areas of each councilor district and the number of the district shall be as stated in these by-laws."

SPEAKER ALESEN: There is no report by Reference Committee No. 4, is there, Dr. Bullis?

DR. BULLIS: No.

SPEAKER ALESEN: Is there any unfinished business on your desk, Mr. Secretary?

SECRETARY GARLAND: No unfinished business.

SPEAKER ALESEN: Is there any new business?

SECRETARY GARLAND: No new business.

DR. O'NEILL: Mr. Speaker, members of the house of delegates: In the rush and press of business which has taken place here today, I think that we all recognize the splendid job that has been done by Cliff Loos and Dr. Behneman and dozens of others, but some times we are prone to overlook a job well done, and I want to say a word about the Committee on Medical Motion Pictures, the chairman of which was Dr. Arthur E. Smith of Los Angeles.

I am sure if any of you attended any of those sessions you will agree with me that he did an outstanding, bang-up job, and I hope that the Committee on Scientific Work will take official cognizance of his splendid work and remember him when they consider the chairmanship for next year.

If it is in order, Mr. Speaker, I would like to offer a vote of thanks for the outstanding job. I would like to propose a vote of thanks for the outstanding job performed by Dr. Arthur Smith as chairman of the Committee on Medical Motion Pictures. (Applause.)

A MEMBER: I second the motion.

SPEAKER ALESEN: Is there discussion? All those in favor of this motion signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: It is so ordered.

The chair recognizes Dr. Garland.

SECRETARY GARLAND: Mr. Speaker, the council asked the secretary to prepare some resolutions to extend a vote of thanks of the house to the city of San Diego for its hospitality during this meeting, to all the local committees which worked so hard to make the meeting successful, to the Woman's Auxiliary and the other groups connected with the annual convention.

The council also desired that the house consider a vote of thanks to the various committees of the association which worked on the scientific program and on other phases of the annual meeting.

I submit these to you in this informal form, Mr. Speaker, and will see they are written up correctly if adopted.

SPEAKER ALESEN: The motion is on the adoption of the secretary's proposals.

A MEMBER: I second the motion.

SPEAKER ALESEN: Any discussion? All those in favor signify by saying, "aye."

. . . The motion was put to a vote and it was carried. . . .

SPEAKER ALESEN: Any other new business?

DR. HODGES: I wish at this time to take note of the fact that earlier this evening an unfortunate occurrence took place which was in bad taste. I wish to refute any connection between this occurrence and the general practitioners at large. If there is any connection in the minds of the audience I wish to apologize on behalf of the general practitioners. (Applause.)

SPEAKER ALESEN: At this time, ladies and gentlemen, the house of delegates: It is my pleasure to present Dr. Donald Cass, your president for 1951. (Standing applause.)

DR. CASS: I am not only speechless, I am almost breathless. I want to ask you delegates to continue to support the office that I am taking in the same manner that you have supported my predecessors, and I feel you will and I know if you do we will continue to prosper and go ahead in our C.M.A. as we always have in the past. Thanks. (Applause.)

SPEAKER ALESEN: Dr. Ball and Dr. Green, will you please do us the honor of escorting Dr. H. Gordon MacLean to the rostrum?

Ladies and Gentlemen, your president-elect, Dr. H. Gordon MacLean.

DR. MACLEAN: Mr. Speaker, Dr. Cass, members of the house of delegates: Thank you very much for the very high honor. I realize that with this high honor goes quite a responsibility. It is one that will demand a lot of work. Dr. Cass and I have worked together in the house of delegates meeting back at the A.M.A. for approximately six years. We have always gotten along very well together, I assure you, and we will continue to do so.

A long time ago an old friend of mine told me the proper way to make a speech is to make a very short one, have a good beginning, put something in between, and have a good ending.

Now I am at the ending and it is just exactly the same as at the beginning which was thank you very much indeed. (Applause.)

SPEAKER ALESEN: Now the vice-speaker, Dr. Donald Charnock. (Applause.)

Now, ladies and gentlemen of the house of delegates: It is planned to have the officers and council of the association come up here before you and subscribe to the oath that you have indicated that you want them to do. Will the councilors please come up to the rostrum at this time and take this oath showing we mean business?

PRESIDENT KNEESHAW: Face the house of delegates, if you will, raise your right hand and repeat after me:

I, (name) solemnly affirm that I do not belong to and have not belonged to any organization advocating the overthrow or change of the form of Government of the United States of America by violent or unlawful means, nor do I believe in changing the form of Government of the United States of America by violent or unlawful means, so help me God. (Applause.)

SPEAKER ALESEN: The chair recognizes Dr. E. Vincent Askey, who will make a presentation.

DR. ASKEY: Mr. Speaker, members of the house of delegates: I, as your immediate past president, before my good friend that I am going to introduce to you, it becomes the one privilege of the immediate past president to do a very, very wonderful thing from his standpoint and a thing that I appreciate very much.

President Kneeshaw, will you step forward?

Dr. Kneeshaw, we have appreciated the many things you have done for us this year. Your services have been outstanding. They have been of the highest grade and of the greatest integrity.

On behalf of this organization and the officers of the California Medical Association, I wish to present to you this plaque, the President's Plaque, which I hope you will always treasure as I do the one which was presented to me last year, and which is one of my dearest possessions.

May I congratulate you, sir, and give you this plaque with our thanks. (Standing applause.)

PRESIDENT KNEESHAW: Dr. Askey, ladies and gentlemen: I want to thank you. I never was destined to become a public speaker, I am sure, but I will try in my humble way to convey to you my pleasure for having been asked to be your president.

It is indeed an honor, and I hope I deserved that honor and the confidence that you placed in me by electing me two years ago.

I have enjoyed the time I have spent with you. It has been hard work, and I know that I have taken away a lot of time from my home, and I hope my wife will welcome me back home as a stranger would come back to his home.

It gives me great satisfaction to know that you will leave the C.M.A. in the hands of a guy like Don Cass. He is sure a swell fellow and I am sure you will be in good hands that are experienced and know what to do.

He will continue to fight for the things that I have fought for. I wish to thank you ever so much for having elected me as your president. I want to, however, tell you that besides this plaque which I will always think much of, I am sure that I will appreciate the fact that I was the first one to administer the oath to these officers. (Applause.)

That to me, I think, is the best part of it all. I know that this will be appreciated when I get old, and I start to get mellow, but not too mellow, and I hope if there is anything you fellows want me to do, if you will ask me, I will try to do it. Thank you. (Applause.)

SPEAKER ALESEN: A motion is in order that the committee approve the minutes. Ordinarily that is left in the hands of the executive committee of the council. There being no objection, that will be done.

Is there anything else to come before the house?

. . . Announcements. . . .

SPEAKER ALESEN: The meeting stands adjourned.

. . . The convention adjourned at 1:25 a.m. . . .

Questions and Answers about C. P. S.

Question: What action should I take if a C.P.S. patient does not signify his C.P.S. membership until after I have billed him for services rendered?

Answer: You should bill C.P.S. as soon as the fact of the patient's membership becomes known. In any case, all bills must be submitted to C.P.S. within six months from the end of the month in which service was rendered. (Note: The C.P.S. Physician Relations Department furnishes small attractive desk plaques for doctors' offices on which is printed the reminder that patients should present C.P.S. membership cards on the first visit.)

Question: Does C.P.S. pay additional fees for post-operative care?

Answer: (a) If there is a "T" after the fee payment in the Fee Schedule, there is no additional fee for after visits, unless exceptional complications develop.

(b) If there is an asterisk (*) after the fee payment in the Fee Schedule the fee is only for the primary procedure, and all after visits are paid for additionally by C.P.S.

(c) If there is no mark on the Fee Schedule, the fee includes two weeks' after-care and C.P.S. pays for necessary after visits beyond that time.

Question: If a C.P.S. patient who has Two-Visit Deductible medical coverage has paid for the first two visits to one doctor and is referred by that doctor to a second doctor for treatment of the same ailment, is the patient again responsible for the first two visits?

Answer: No. Holders of Two-Visit Deductible medical coverage are responsible for only the first two visits for each ailment, even though they may be referred to a second doctor. (Note: All referrals should be indicated on the billing form.) However, if the patient changes of his own accord, he is again responsible for the first two visits.

Question: How do I handle the veteran who comes to my office and *demands immediate treatment?*

Answer: By telling him that the V.A. will not pay for visits made before authorization is issued and that, therefore, you must bill him as a private patient until authorization is received.

In actual emergencies, authorization may be secured by telephone to either the San Francisco or Los Angeles C.P.S.-Veterans offices after service connection has been established.

Question: After a veteran's case has been established as service-connected, and I have authority to treat him, why must I ask for a new authority every month?

Answer: Because to pay for every authorization issued, actual money must be encumbered in advance in the budget for that period, and funds must be ear-marked in advance for payment of each subsequent authorization as treatment progresses.

Question: May I bill C.P.S. patients for any difference between the C.P.S. fee and my regular charge?

Answer: The answer depends on whether the patient's income is over or under the income ceiling. Under terms of physician-members' membership in C.P.S., if income is under the ceiling, they *may not* charge the difference between the C.P.S. fee and their usual fee. If income is over the ceiling, doctors are entitled to charge the difference between fees. The income ceiling also applies to x-ray and laboratory services. (Note: The income ceiling for all C.P.S. members, except Grange members, is $3,600 annual gross family income from all sources, for the preceding calendar year. For Grange members it is $3,600 *net* family income as computed for Federal income tax for 1949.)

Question: Are payments for routine physical examinations or check-ups provided under any C.P.S. contract?

Answer: No, because C.P.S. covers only active illnesses and injuries.

Question: This being vacation time, some of my patients ask me if their C.P.S. benefits extend outside California. What is the rule on this?

Answer: C.P.S. benefits are available anywhere in the world. For members who are traveling or temporarily residing outside California, C.P.S. will pay up to the amount paid to California physician-members and hospitals for like services, provided the services have been rendered by a licensed physician, surgeon or hospital. Patients should pay the bill and then claim reimbursement from C.P.S., submitting the receipted bill with the claim.

Question: What is the interpretation of the "three months' chronic condition clause" as regards the period during which a C.P.S. patient is eligible for treatment of a chronic condition?

Answer: The interpretation of this clause is that the patient is entitled to three *consecutive* months' treatment for a chronic condition. In other words, contract benefits for a chronic ailment expire three months after the date that the patient first utilizes his C.P.S. coverage for that condition, regardless of the amount of treatment received during the three months. The clause does not mean three months' care at broken intervals.

Question: What surgical treatment, if any, can be given a veteran under the C.P.S.-V.A. Home Town Medical Care Plan?

Answer: Only minor operations which have been authorized by V.A. and can be performed safely in the doctor's office, or on a "come and go" basis in a hospital. "Come and go" means use of minor operating room facilities in the outpatient department and less than an overnight stay with no meals served. The condition must be service-connected.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Appointment of **Dr. Pauline O. Roberts** as assistant district health officer of the southeast and southwest districts of Los Angeles was announced last month by Dr. George M. Uhl, Los Angeles city health officer.

* * *

The **Second Postgraduate Assembly,** sponsored by the staff of Saint John's Hospital, Santa Monica, will be held September 11, 12, 13, 1950. There will be panel discussions on diseases of the kidneys, parenteral fluid balance, focal infections, ACTH and cortisone, and cirrhosis of the liver, and seminars will be held on pediatrics and obstetrics.

RIVERSIDE

Dr. Everett Stone recently was appointed Riverside County health officer to succeed Dr. Robert Westphal who resigned to become health officer of Sonoma County. Dr. Stone had been Dr. Westphal's assistant.

SAN FRANCISCO

A **World Health Organization** fellowship has been awarded to Dr. E. Richard Weinerman, visiting associate professor of medical economics and head of the division of medical care administration at the University of California School of Public Health. Dr. Weinerman will study teaching and research programs in the preventive and social aspects of medicine being carried out by various European universities.

* * *

The Borden Foundation Undergraduate Research Award, a cash prize of $500, given to the member of the graduating class of the University of California School of Medicine for the best original research, this year was presented to Eugene Eisenberg for his work on the steroid hormones. **A special award** of $250, given anonymously, was presented to John Langton in recognition of his research on pain patterns.

YUBA-SUTTER-COLUSA

Dr. Edith Young, formerly Sonoma County health officer, has been appointed health officer of the bi-county Sutter-Yuba Health Department. She succeeds Dr. Carl A. Scherer who resigned because of ill health.

GENERAL

The Los Angeles Heart Association and the heart division of the San Francisco Tuberculosis Association will hold **postgraduate symposiums on heart disease** in October. The meeting in Los Angeles is scheduled for October 18 and 19 in the Wilshire-Ebell Theater, and the San Francisco meeting for October 25-28 at the St. Francis Hotel. Guest speakers at both meetings will be Dr. George Pickering, professor of medicine, University of London, and Dr. Carl J. Wiggers, professor of physiology and director of the department of physiology, Western Reserve University, Cleveland.

The American Congress of Physical Medicine will hold its 28th annual scientific and clinical session August 28, 29, 31 and September 1, 1950, inclusive, at the Hotel Statler, Boston. All sessions will be open to members of the medical profession in good standing with the American Medical Association. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

* * *

Effective since June 1, the **new fee schedule for the CPS-VA** Home Town Care Program brings a general inincrease in payments to physician-members for services rendered to veterans with service-connected disabilities. The higher fees are the result of negotiations that had been under way between C.P.S. and the Veterans Administration since the standard C.P.S. fee schedule for the commercial program was introduced in September, 1949. With but few exceptions, the new veterans' fee schedule has now been brought into conformity with the commercial schedule.

Of particular interest to physician-members is that payments for office visits have been increased from $2.50 to $3.00, while payments for follow-up home visits have been raised from $3.75 to $5.00. These higher fees are of greater significance when it is considered that by far the largest percentage of all C.P.S. payments are for home and office visits. Also of importance is the fact that payments under the veterans' fee schedule, as in the past, are made at the full schedule rate.

* * *

Award of four grants to California institutions to aid in **research on diseases of the heart and arteries** was announced last month by the Life Insurance Medical Research Fund. In addition, a postgraduate research fellowship was awarded to a California physician.

The awards to institutions:

Scripps Metabolic Clinic, La Jolla, for research by Dr. Eaton M. MacKay on the metabolism of pressor amines in relation to hypertension, $2,625.

Stanford University School of Medicine, San Francisco, for research by Dr. Emile Holman on experimental valvular disease, cardiac anastomoses, and hemodynamics, $5,880.

University of Southern California School of Medicine, Los Angeles, for research by Dr. Clinton H. Thienes on cellular mechanisms in the action of drugs on the cardiovascular system, $8,925.

University of California School of Medicine, Berkeley, for research by Dr. I. L. Chaikoff on the metabolic characteristics of arterial tissue and the pathogenesis of arteriosclerosis, $18,795.

The fellowship was awarded to Dr. Gordon M. Tomkins, of Los Angeles, for research under the supervision of Dr. I. L. Chaikoff at the University of California School of Medicine, Berkeley.

* * *

The American Society for the Study of Sterility offers an annual award of $1,000, known as the Ortho Award, for an outstanding contribution to the subject of infertility and sterility. Competition is open to those in clinical practice as well as individuals whose work is restricted to research in the basic sciences. Essays submitted for the 1951 contest must be received not later than March 1, 1951. The prize essay

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

JULY 1950

University of California at Los Angeles School of Medicine

Diagnosis and Therapy of Cancer—July 17 to 22, 1950.

Address: 813 South Hill Street, Los Angeles.

AUGUST 1950

University of California at San Francisco, Langley Porter Clinic

Psychiatry and Neurology—August 28 to November 17, 1950.

Address: Stacey R. Mettier, M.D., Professor of Medicine, Head of Postgraduate Instruction. Medical Extension. University of California Medical Center, San Francisco 22, California.

SEPTEMBER 1950

University of Southern California, School of Medicine

Clinical Review of Internal Medicine—12 weeks full-time from September 11 to December 1, 1950.

Cardiology and Vascular Disease—12 months. full-time from September 11, 1950 to September, 1951.

Hematology—12 weekly, 2-hour evening lectures. Clinical application of newer diagnostic methods in cardiology. Given at Los Angeles County Hospital.

Recent Advances in Surgery, Obstetrics and Gynecology—Given in San Diego.

Electrocardiography—Given at Centinela Hospital, Inglewood.

University of California at Los Angeles

Symposia on Therapy in Metabolic, Endocrine and Gastrointestinal Diseases—September 20 to December 13, 1950. Wednesday evenings, 8 to 10 p.m.

Surgical Anatomy—September to December, 1950.

Stanford University, School of Medicine

September 11 to 15.

Morning Courses: Monday, Tuesday, Wednesday, Thursday and Friday, 8:30 a.m. to 12 noon.

Course 1—General Surgery
Course 2—Acute Surgical Emergencies
Course 3—Surgical Anatomy
Course 4—Internal Medicine
Course 5—Electrocardiography
Course 6—Diseases of the Chest
Course 7—Pediatrics

Afternoon Courses: 1:30 to 5 p.m.

Course 8—Surgical Anatomy
Course 9—Proctology
Course 10—Fundamentals of Roentgen Diagnosis
Course 11—Fractures
Course 12—Internal Medicine
Course 13—Obstetrics and Gynecology

Address: Stanford School of Medicine. 2398 Sacramento Street, San Francisco 15, California.

OCTOBER 1950

University of California at Los Angeles

Recent Advances in Obstetrics and Gynecology—One week.

NOVEMBER - DECEMBER 1950

University of California at Los Angeles

Ophthalmology.

DECEMBER 1950

University of California at Los Angeles

Internal Medicine—9 months full-time. December 4. 1950 to September 1951.

JANUARY 1951

University of California at Los Angeles

Advanced Hematology—Eight lectures.

* * *

TWO-DAY MEDICAL INSTITUTES, sponsored by the COMMITTEE ON POSTGRADUATE ACTIVITIES and by the local county society in each locality (exact dates to be announced later).

Santa Barbara in October 1950.

Fresno in November 1950.

Riverside in January 1951.

Santa Rosa in February 1951.

Sacramento in March 1951.

will appear on the program of the 1951 meeting of the society. For full particulars, address the American Society for the Study of Sterility, 20 Magnolia Terrace, Springfield, Mass.

* * *

Administrative separation of the **California Tuberculosis and Health Association** and the California Heart Association was announced recently. The joint operation of the two organizations was terminated by mutual agreement because of an "increased need for additional funds for medical research and program development in heart disease which the Christmas seal sale alone could not adequately supply without seriously jeopardizing the 46-year-old campaign to stamp out tuberculosis," according to official announcement. The California Heart Association has reestablished direct affiliation with the American Heart Association, and hereafter will conduct its own fund-raising program in California. Under the plan of separation, C.T.H.A. will continue financial support of C.H.A. on a diminishing scale until 1953.

The close relationship between the two groups will be continued. They will continue to use combined facilities, sharing the cost.

* * *

After a number of years of joint operations, **California Physicians' Service** (Blue Shield) and Hospital Service of Southern California (Blue Cross) will terminate their joint operating agreement December 1, 1950.

This decision, made at a recent meeting of the governing boards of the two organizations, means that after December 1 C.P.S. will function throughout the state as an independent physicians' organization—as it has long done in Northern California. The action was taken by C.P.S. and H.S.S.C. in the interest of greater service to the public and improved operating efficiency.

The present status of C.P.S. physician-members is not affected and there will be no change in existing claims or payment procedures. Similarly, the several hundred thousand C.P.S.-Blue Shield members in Southern California may continue their present benefits without change or interruption.

* * *

The American College of Physicians has announced that a limited number of fellowships in medicine will be available from July 1, 1951 to June 30, 1952. These fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in the early stages of their preparation for a teaching and investigative career in internal medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work. The stipend will be from $2,200 to $3,200.

Application forms will be supplied on request to the American College of Physicians, 4200 Pine Street, Philadelphia, 4, Pa., and must be submitted in duplicate not later than October 1, 1950. Announcement of awards will be made in November 1950.

* * *

Pamphlets containing a statement of policy adopted by the American Association of Registration Executives and the Council on Vital Records and Vital Statistics regarding **the confidential nature of birth records** are available in limited number to physicians who request them, according to recent announcement by the Federal Security Agency. The announcement said that copies were being sent to all local medical groups.

Single copies may be obtained by addressing Halbert L. Dunn, M.D., National Office of Vital Statistics, Washington, 25, D. C.

BOOK REVIEWS

ELECTROCARDIOGRAPHY—Fundamentals and Clinical Application. By Louis Wolff, M.D., Associate in Medicine, Harvard Medical School. W. B. Saunders Company, Philadelphia, 1950.

This relatively brief book on electrocardiography is a very clear and concise discussion of the present concepts of the subject. In brief but adequate manner the author has outlined the basic principles of the electrical phenomena associated with muscle contraction. The first few chapters discuss the dipole theory, volume conductors, intrinsicoid deflections, vectors, primary and secondary T wave changes and in general prepare the reader to approach electrocardiography from the physiologic, rather than the empiric point of view.

In the section on clinical electrocardiography there is an excellent balance and restraint, and the author very properly cautions against diagnosis without adequate evidence. He discusses electrocardiography perhaps too simply, in that only the well-developed patterns are described. The large mass of early patterns and developing patterns is inadequately discussed.

A few sections in which the reviewer disagrees with the author may be cited:

On page 88 the author gives a figure of 0.02 seconds as the maximum intrinsicoid deflection in V_1 and 0.035 seconds as the maximum in V_6. These upper limits are too short and should be increased to 0.035 for V_1 and 0.05 for V_6. On page 89 the author states that the normal QRS interval usually does not exceed 0.08 seconds. Most electrocardiographers would certainly admit that many normal subjects have QRS intervals exceeding this figure.

The problem of incomplete right bundle branch block is not clearly discussed. At times the author states that the presence of R′ in V_1 is unimportant as long as the QRS is within normal limits; at other times he suggests incomplete right bundle branch block. Of course, there is no fundamental agreement even among electrocardiographers on this point. On page 96, in the discussion of bundle branch block, the author states that "Q waves in left ventricular curves of right bundle branch block probably indicate disease of the I-V septum." He does not clearly indicate, as has been shown by Wilson and his co-workers, that the presence of a Q wave in left precordial leads in a record resembling left bundle branch block is usually associated with myocardial infarction. In Figure 41 the interpretation is given as "left ventricular hypertrophy," but the deeply inverted T wave in AVF in association with a horizontal heart should make one wonder about posterior infarction, and esophageal leads would have been helpful.

In the discussion of left ventricular hypertrophy the author tabulates "Q waves common in V_6" as one of the signs of left ventricular hypertrophy (page 109). He does not clearly state that Q waves are also common in normals.

In the discussion on right ventricular hypertrophy (page 119) the author states that diagnostic is the fact that the intrinsic deflection occurs later in V_1 than in V_6. This is misleading and not always true. The intrinsic deflection is usually delayed in V_1 but does not necessarily occur later than that in V_6. In Figure 53 a diagnosis of right ventricular hypertrophy was made on the basis of a deep S in V_6. The author did not discuss the possibility that the transitional zone was displaced further to the left in V_6 in view of the normal appearing QRS complex in AVF, in the presence of a vertical heart. The record suggests incomplete right bundle branch block.

In the section on coronary heart disease, the only criticism is the fact that the author is unwilling to make a diagnosis of myocardial infarction on serial T wave changes. In Figures 59 and 60 for example, progressive T wave changes of characteristic contour without significant QRS changes were described. While it is true that one should hesitate to make a diagnosis of myocardial infarction in the absence of QRS changes, one should be prepared to make the diagnosis when the typical evolutionary waxing and waning occurs with T waves of typical contour.

In the section on pericarditis most electrocardiographers would disagree with the author that Figure 96 is due to acute pericarditis and not due to myocardial infarction. The clinical fact that the patient had repetitive episodes of constricting chest pain over an 18-month period is also very difficult to explain on the basis of pericarditis.

In the section on pulmonary embolism, the changes shown in Figure 97 are too minor to be described as diagnostic of cor pulmonale. The illustrations of Figures 98-101 are much more representative and Figure 97 should be deleted.

Despite the above points of difference, Wolff's book is an excellent elementary text for the student, general practitioner or internist who is not familiar with unipolar leads and the modern electrophysiological concepts of electrocardiography. The clarity, style and excellence of the illustrations make the book easily readable. The book can be highly recommended.

* * *

1949 YEAR BOOK OF OBSTETRICS AND GYNECOLOGY. Edited by J. P. Greenhill, M.D. The Year Book Publishers, Inc. $4.50.

No treatise on obstetrics and gynecology can give the practicing physician a more complete summary of what is new and what is effective than the 1949 Year Book edited by J. P. Greenhill, M.D. The comments are fair criticism and offer evidence that personal opinions alone are not expressed in these interesting paragraphs.

The ability to summarize the many long articles which have appeared during the year makes the Year Book a ready reference to the latest and best.

The discussions of erythroblastosis, genital prolapse and the problems of malignancy deserve special mention. Endocrinology is again presented in a sensible and complete review without the unwarranted enthusiasm of many of the authors. Again, Greenhill's book can be recommended as the review of reviews in obstetrics and gynecology.

* * *

A STORY OF NUTRITIONAL RESEARCH—The Effect of Some Dietary Factors on Bones and the Nervous System. By Sir Edward Mellanby, G.B.E., M.D., Sc.D., Secretary of the British Medical Research Council. The Williams and Wilkins Company, Baltimore, 1950. $5.00.

Mellanby's Flexner Lectures, delivered at Vanderbilt University, constitute a ponderous story of one aspect of the problem of research in nutrition, namely the rachitogenic features of certain artificial diets. The volume presents a detailed protocol of experimental work dealing with the effects upon the nervous system and the osseous system of the accessory food factors, vitamin A, calcium, phosphorus, phytic acid, phytase and the anticalcifying substance in cereals. The problem of vitamin A deficiency and its relation to nerve degeneration and muscular incoordination in laboratory animals (rabbits, dogs, ferrets, rats, chickens,

etc.) is clearly presented, and although the neurologic lesions are definitive under circumstances of rigidly controlled dietetic restrictions, similar changes occurring in the human subject are hardly possible because of the myriad protective effects of other substances taken in the mixed diet. The possible exceptions to the above are xerophthalmia and hemeralopia, which may occur with relatively minor vitamin A deficiencies. Mellanby has also shown that there is an associated osseous dysplasia (bone overgrowth) around the central nervous system structures in vitamin A deficiencies.

Part II of the volume deals with the anticalcifying or rachitogenic action of cereals. The experimental evidence for the anticalcifying effect of phytic acid and the protective effects of vitamin D are well presented. Although this book may be of value to workers in the field of research in nutrition, the volume is of limited used to the physician, as it deals with a subject which is still in a controversial state.

* * *

QUINIDINE IN DISORDERS OF THE HEART. By Harry Gold, M.D., Professor of Clinical Pharmacology, Cornell University Medical College, Paul B. Hoeber, Inc., New York, 1950. $2.00.

Gold's monograph of 100 pages is the first book dealing solely with the use of the important drug quinidine. The author has followed a uniform plan and has discussed in turn the details of indications, therapeutic actions, toxic actions, effect on the electrocardiogram, clinical pharmacology, dosage, and the prevention and treatment of all the minor and major arrhythmias with which the practitioner may be presented. There is a very brief discussion of quinidine in children and of alternative routes of administration, and a chapter on combined use of quinidine and digitalis. The section on pharmacology of the drug is clear and concise, as would be expected from the special qualifications which the author has in this field. The reviewer strongly concurs in Gold's statement that "the use of inflexible systems of dosage is responsible for a large share of the defeats in quinidine therapy, and some of the disasters." Gold indicates, but does not emphasize as clearly, that the disasters are often due as much to failure of careful supervision, with repeated clinical and electrocardiographic observations during and after conversion of an arrhythmia, as to the inflexibility of the system of dosage.

The major criticism that the reviewer has of the monograph concerns Gold's handling of the chapter on chronic auricular fibrillation. Many cardiologists would disagree with his statement (on page 53) that the use of quinidine in long-standing auricular fibrillation has, for the most part, been abandoned. He admits that quinidine is blamed for accidents which are purely coincidental, yet stresses the fact of occasional serious complications of quinidine therapy without giving sufficient emphasis to the hazards of auricular fibrillation per se, and to the benefits that may be obtained by converting some patients with auricular fibrillation to normal rhythm.

One might question the author's recommendation to avoid the simultaneous use of quinidine and digitalis whenever possible. His stress on the toxicity of quinidine in animals poisoned with digitalis does not do justice to the clinical fact that the two drugs have been repeatedly used in combination without difficulty when poisoning with either drug is avoided. If quinidine is used without prior digitalization in patients with auricular fibrillation, acceleration of the ventricular rate with quinidine may be so great as to force cessation of quinidine therapy.

With the reservations noted in the discussion of chronic auricular fibrillation and of the combined use of digitalis and quinidine, this monograph can be strongly recommended to the practitioner as an excellent guide to the understanding and successful use of quinidine.

DIFFERENTIAL DIAGNOSIS OF CHEST DISEASES. By Jacob Jesse Singer, M.D., Medical Director of the Rose Lampert Graff Foundation, Beverly Hills. Lea & Febiger, Philadelphia, 1949. $7.50.

This book appears to be somewhat unbalanced. For example, coccidioidomycosis is given one-fourth of a page with no mention of the generally accepted diagnostic procedures, while there is a complete chapter on hydatid cyst of the lung and another chapter on lipoid pneumonia.

The title of the book excludes therapeutic considerations, which will greatly curtail the value of this volume to many physicians. However, the author is inconsistent in devoting considerable space to surgical treatment of pulmonary tuberculosis. Insufficient consideration is given to the modern bacteriologic methods of diagnosing pulmonary tuberculosis. Too much emphasis is placed upon bronchoscopy as a diagnostic procedure in bronchiectasis, and so important a disease as pulmonary embolism is neglected.

* * *

HORMONES IN CLINICAL PRACTICE. By H. E. Nieburgs, M.D., Research Associate Department of Endocrinology, Assistant Professor, Department of Oncology, University of Georgia. Paul B. Hoeber, Inc., New York, N. Y., 1950. $5.50.

The author of this book is a research endocrinologist who originally worked in England and who is now at the University of Georgia in this country. His style and interpretations show characteristics of training in endocrinology on both sides of the Atlantic.

In the general format of the book, separate chapters are devoted to the hormones of a given gland of internal secretion. Each one starts with a rather extensive discussion of the physiology and then proceeds directly to a list of the preparations available for clinical use, with the indications for them, and the dosage. Generally there is little or no discussion of the pathology, or clinical descriptions of the various endocrine diseases—as is indicated by the title of the book. While this has allowed the author to be more complete in the material he does cover, it also narrows the range of usefulness of the book as a reference work for the ordinary practicing physician.

There are also chapters on the pineal and thymus glands, on psychosomatic endocrinology, on non-hormonal substances used in endocrinology, and on vitamin-hormone relationships. They are short, and represent principally the collection and discussion of some bibliography on these subjects.

Toward the end of the book is an extensive chapter on endocrine diagnostic procedures. These are well described, but one has the impression that the compilation is not quite up to date. For instance, 11 pregnancy tests are listed, but the recent test using male frogs and toads which is now coming into considerable acceptance is not included. The count of circulating eosinophils now widely used by endocrinologists in estimating adrenal cortical function also is not mentioned.

Finally, a list of commercial preparations is appended. Although the author makes no claims for completeness, it is an extensive list, and may be of some help. One example of an apparent omission is the lack of distinction between the types of methyl testosterone that are prepared to be swallowed or to be administered sublingually or for buccal absorption. It is always difficult to keep such a list up to date.

The book is an admirable piece of work, but some criticism seems indicated by the following observations: In the physiological sections, there are occasional quite dogmatic statements regarding matters which are still in a state of discussion in many laboratories and are not generally accepted as having been proven. Various preparations are listed, with dosage, etc., which have very little clinical application. These are listed with the more generally used

and more effective preparations without any critical discussion to indicate relative values. The physician without special training or experience could well be led astray. An extensive bibliography is given at the end of each chapter, but unfortunately a few errors are apparent. The discussion on antithyroid substances is principally on thiouracil. Very little space is given to propylthiouracil which is now acknowledged to be considerably safer and more effective and is much more generally used. The data that are given seem to have been added as an afterthought.

The recent work on ACTH and Compound E in arthritis and other diseases is not mentioned.

In general, the book is interesting reading for an endocrinologist and would be an addition to the library of anyone particularly interested in this field. Its value to the practicing physician without training and experience in endocrinology is doubtful.

* * *

AIR POLLUTION IN DONORA, PA. Epidemiology of the Unusual Smog Episode of October, 1948. Preliminary Report. Public Health Bulletin No. 306. Federal Security Agency. Public Health Service, 1949.

In October 1948 the small mill town of Donora, Pennsylvania, was smothered for three days with unprecedented smog. Twenty persons allegedly died as a result of the pollutants in the atmosphere and some several hundred more were affected. Various agencies were called into the area to study the cause and effect of the smog, among which was the United States Public Health Service. Public Health Bulletin No. 306 is the published data of a five-month study by this group.

This exceedingly attractive publication is about the size of *Fortune*. There are short introductions, etc., by Oscar Ewing, administrator of the United States Public Health Service, as well as by Surgeon General Leonard A. Scheele, James G. Townsend, chief, Division of Industrial Hygiene, and his assistant, J. J. Bloomfield. Some 37 individuals have contributed to the research activities, as well as to the publication of the bulletin.

Bulletin 306 is well illustrated with photographs, reproductions of chest films, microphotographs of pathological slides, drawings, graphs, tables, etc. The work is divided into the following: (1) Introduction, (2) Biological Studies, (3) Atmospheric Studies, (4) Discussion of Cause of the Episode and (5) Summary and Recommendations. Certain members of the team were assigned to a community and house-to-house survey in which the inhabitants were questioned as to their reactions at the time of the smog episode. The practical application of such a statistical study is to be questioned.

Unfortunately, no samples of the air were obtained during the episode, so that the concentration of contaminants in the atmosphere at that time could not be determined. Later studies of the industrial operations and stack output in the valley indicated that the single most significant material polluting the air was sulfur dioxide. It was felt, however, that "it was doubtful that either sulfur dioxide or sulfur trioxide, acting individually or together, reached levels that were capable of producing the syndrome."

Over 90 per cent of the persons affected complained of upper or lower respiratory symptoms. Most of the severe cases and all of the deaths occurred in the older age groups, among individuals with preexisting pulmonary or cardiac pathology. Autopsied cases showed acute pathology primarily in the "terminal bronchi, the bronchioles and the pulmonary parenchyma."

It is the opinion of the United States Public Health Service that "while no single substance was responsible for the October 1948 episode, the syndrome could have been produced by a combination, or summation of the action, of two or more of the contaminants."

HANDBOOK OF DIGESTIVE DISEASES. By John L. Kantor, M.D., Late Associate Professor of Medicine, and Anthony M. Kasich, M.D., Lecturer in Medicine, both at Columbia University. Second Edition. Illustrated. The C. V. Mosby Company, St. Louis, 1949. $11.00.

Dr. Kasich has done a commendable job of enlarging and bringing up to date Dr. Kantor's earlier, smaller "Synopsis of Digestive Diseases." The result is a practical, clinical volume in which the disease entities are separated in the usual textbook fashion. The illustrations are numerous and to the point. The approach to the subject is from a sound physiological point of view. The fundamental aspects of digestive diseases are presented concisely.

The book gives the general practitioner, surgeon, or internist a good source of up-to-date information on gastrointestinal diseases — better and more pointed than that which he will find in a general text on the practice of medicine. It is highly recommended.

* * *

BRUCELLOSIS (UNDULANT FEVER) Clinical and Subclinical. By Harold J. Harris, M.D., F.A.C.P., with the assistance of Blanche L. Stevenson, R.N. Second Edition, Revised and Enlarged. Paul B. Hoeber, Inc., 1950. $10.00.

This handsome monograph of some 600 pages tells about all there is to know on the subject of brucellosis. History, etiology, pathology, the various clinical features of acute and chronic brucellosis, are all thoroughly discussed. Under therapy even the recent results with aureomycin are included. There are many good illustrations, a large bibliography and an index. The volume does not lend itself to detailed review but seems definitive to date as a reference work.

* * *

NUTRITIONAL DATA. Compiled by Harold A. Wooster, Jr., and Fred C. Blanck. Published by the H. J. Heinz Company, P. O. Box 57, Pittsburgh, Pa.

This brochure, which may be had gratis for the asking, is a truly remarkable compendium and collection of the important data on dietetics, nutrition and the biochemistry of food and food products. It contains an excellent epitome of the vitamins, including the signs and symptoms of their deficiency, and their dietary sources. The text dealing with the essential mineral elements is the most comprehensive and intelligible presentation of the subject available. The dietary sources of the mineral-rich foods makes this section unusually practical.

The section dealing with the essential amino acids is amazingly well presented and terse. The material is condensed in the form of tables which epitomize those foods rich in the essential amino acids. There is a short section which deals with the practical chemical tests for the detection of malnutrition, which is followed by tables indicating the cardinal features of nutritional anemias, and deficiency diseases of the epithelium. For the person trained in biochemistry, the latest information concerning the intermediate metabolism of the carbohydrates, fats, and nitrogen compounds is given along with a discussion of the enzymes involved in digestion. The last half of the volume contains charts of the recommended daily dietary requirements followed by a synoptic section dealing with diet in health and disease.

One of the most valuable features of the volume is the extensive collection of tables giving the composition and the nutritive value of foods according to dietetic groupings. This section is invaluable to the practicing physician. And for those who wish to use prepared or canned foods, there is appended the analysis of all available products of the Heinz Company. The volume is highly recommended as a valuable addition to the physician's ready reference library.

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Antabus and the Metabolism of Alcohol

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SUMMARY

Antabus does not alter the rate of alcohol metabolism in dogs. It interferes with the metabolism of acetaldehyde, so that the ordinarily prompt removal of this substance from the tissues as it is produced in the metabolism of alcohol does not take place.

It seems reasonable to assume that it is this accumulation of acetaldehyde in the tissues in abnormally high concentrations that is responsible for the unpleasant symptoms following the taking of alcohol by a patient receiving antabus.

IT is natural that any agent showing promise in therapy of alcoholism should be enthusiastically acclaimed by both the medical profession and the public at large, and such acclaim has fallen to the new drug, tetraethylthiuram disulfide. Fittingly called antabus, this drug was first employed by a group of Danish investigators, and has had considerably popularity in Scandinavia. During the past two years it has been subjected to clinical trial in this country, much of the work being encouraged by the Council on Pharmacy and Chemistry of the American Medical Association, in an effort to ascertain whether or not it should be released for general use. Since such release has not as yet been forthcoming, it is probable that not all the information so far gathered is favorable.

From the Department of Medicine, Stanford University School of Medicine, San Francisco.

Chairman's Address: Presented before the Section on Psychiatry and Neurology at the 79th Annual Meeting of the California Medical Association, April 30-May 3, 1950, San Diego.

The purpose of this presentation is to report the results of an investigation of the effect of the drug on the metabolism of alcohol rather than its clinical effect on alcoholism.

Antabus by itself does not produce any symptoms in the dosages employed but results in very unpleasant symptoms when alcohol is taken as well, and this of course is the basis of the treatment, which consists of maintaining the patient on the dose of antabus adequate to make any alcoholic indulgence too costly in discomfort.

It was noted by the Danish investigators that the symptoms shown by a patient who took alcohol after having been maintained on adequate dosage of antabus resembled closely those reported as resulting from administration of acetaldehyde. It has long been accepted that acetaldehyde is probably an intermediary product in the metabolism of alcohol in the animal body. Small amounts of acetaldehyde are to be found in the blood of normal animals, so it is not a substance foreign to the bodily economy. Supniewski[10] as early as 1927 showed that in the blood of the rabbit there was 0.54 mg. of acetaldehyde per 100 cc., while in normal dogs the content was 0.08 mg. per 100 cc. Handovsky and Heymans[6] found acetaldehyde in normal blood and urine. Furthermore, ingestion of alcohol has been found to increase the acetaldehyde content in the blood significantly. Supniewski[10] gave alcohol in a dose of 2.5 gm. per kg. of body weight to dogs and found acetaldehyde content of 0.75 mg. per 100 cc. of blood, while in rabbits given the same dose the blood content of the drug was 1.5 mg. per 100 cc. Simultaneous administration of insulin about doubled the height of rise of the blood acetaldehyde, and it is known that insulin increases the rate of metabolism of alcohol. Hald and Jacobsen[3] found

that in man ingestion of 40 cc. of alcohol produced a blood acetaldehyde of 0.105 mg. per 100 cc. Thus it would appear that acetaldehyde is formed in the metabolism of alcohol in the body, and that the rate of formation must be sufficiently rapid for some of the substance to accumulate in the tissues and appear in the blood stream. This level is not sufficiently high to produce symptoms, certainly not of the type reported after antabus and alcohol. However, the Danish investigators found that if they administered acetaldehyde intravenously to human subjects they were able, by controlling the rate of injection, to produce symptoms reported by them to be exactly similar to those observed after antabus and alcohol. An infusion rate of 80 mg. per minute, or 4.8 gm. per hour, produced a blood acetaldehyde of 0.7 mg. per 100 cc., while half this amount gave 0.3 mg. per 100 cc. A dose of alcohol adequate to raise the blood alcohol concentration to 50 mg. per 100 cc. produced a blood acetaldehyde of 0.1 mg. per 100 cc. in a normal patient, while Hald and Jacobsen[3] reported that when alcohol was given to a subject who was taking antabus the blood acetaldehyde rose to about 0.5 mg. per 100 cc. Since this is well above the concentration found to produce symptoms, they felt that the evidence was clear that the symptoms produced when alcohol is taken by a patient on antabus are due to an increased level of acetaldehyde in the blood and tissues.

The problem remains as to how the antabus operates to produce this increase in blood acetaldehyde. The two most likely possibilities are an increased production of acetaldehyde and a decrease in the rate of its destruction. As to the first, accepting the theory that all alcohol in its metabolism passes through an initial dehydrogenation to acetaldehyde, the only way for more acetaldehyde to be formed is for more alcohol to be burned. As the rate at which alcohol disappears from the blood stream has been extensively studied and is pretty well understood,[2] any significant change should be easy to determine.

Hald, Jacobsen and Larsen[4] have reported that the rate of alcohol metabolism is unchanged by previous administration of antabus. However, Larsen[7] found that when alcohol was slowly infused into animals premedicated with antabus, the amount of acetaldehyde formed was greater with more rapid rates of infusion. He could not reconcile this finding with the generally held belief that the rate of alcohol metabolism is independent of its concentration in the tissues. The more recent concept that alcohol metabolism is indeed, to some extent at least, influenced by concentration[2] may make this finding more plausible.

There remains the possibility that acetaldehyde, rather than being formed more profusely, is itself metabolized less rapidly in the animal receiving antabus. This should be readily capable of proof, but no well-documented evidence on the point has appeared to date. Hald and Jacobsen[3] referred to some work done by colleagues, but then unpublished, to the effect that acetaldehyde is eliminated in animals on antabus at the same rate as in normal animals. If this finding were accepted, it would make the whole matter of the effect of antabus inexplicable. That was the reason for the investigation here reported.

It has been established[9] that although a single 100 mg. dose of acetaldehyde readily kills a 200 gm. rat by respiratory depression, such an animal may receive doses of 20 mg. at 15-minute intervals until 250 mg. has been given without any symptoms being apparent. It has also been demonstrated[11] that the lethal dose by subcutaneous injection is four times as great as by intravenous injection. All this implies that acetaldehyde is quite toxic, but that destruction of the drug in the body proceeds quite rapidly.

EXPERIMENTAL WORK

Since the metabolism of alcohol in dogs is very similar to the process in man, dogs were chosen as the experimental animal. As protracted intravenous injections were to be done, it was considered expedient to anesthetize the animals with pentobarbital sodium by the intraperitoneal route. This had the disadvantage, however, of obscuring any minor signs of acetaldehyde toxicity, so that the investigation developed no adequate observations on the clinical manifestations of the effect of acetaldehyde in the dogs.

Alcohol in a solution of 10 per cent by volume was infused by gravity into a vein in the leg. Infusion of the dose of 1.0 gm. per kg. of body weight took about 10 minutes. Acetaldehyde was also given intravenously by gravity, a 2 per cent solution being made up by the addition of freshly distilled acetaldehyde to normal saline. Care was taken to keep the container of acetaldehyde cooled by surrounding it with a jacket of ice to minimize loss of this very volatile substance by evaporation during the prolonged injection. This was continued over a period of six hours. On one occasion the rate of injection was 185 mg. per kg. per hour, which represents the maximum reported rate of alcohol metabolism in the dog, while on another it was 100 mg. per kg. per hour, the approximate rate of alcohol metabolism in the dogs involved.

At appropriate intervals blood samples were taken from another vein than that used for the infusion, with heparin as the anticoagulant. All apparatus was previously cooled to avoid loss of acetaldehyde, the sample was immediately refrigerated, and the analysis for acetaldehyde was made within a few hours at most, using the method of Burbridge, Hine and Schick.[1] This method entails delivery of the blood sample into the outer chamber of a Conway microdiffusion unit, the center chamber of which contains a known amount of semicarbazide reagent. Diffusion is allowed to take place for 90 minutes at 28° C., the contents of the central chamber is washed into a test tube graduated at 10 cc., and brought to volume with distilled water, and the optical density at wave length 224 millimicrons determined in the

Beckman spectrophotometer. A calibration curve having been previously prepared by using the same procedure with known concentrations of acetaldehyde, the value of the specimen can be read directly from the curve.

In those experiments in which alcohol was administered, alcohol determinations were done on the same samples, using the method described by Newman[8] with the modification that iodometric titration against standard thiosulfate solution was substituted for the colorimetric procedure as a matter of convenience.

RESULTS

Two mongrel dogs, designated A and C, weighing 10 kg. and 8 kg., were used for all the experiments. A dose of alcohol of 1.0 gm. per kg. was administered intravenously, and samples of blood were taken 30 minutes, one, two, three, four, five, and six hours after the start of the infusion, which required ten minutes.

The rate of decline of blood alcohol concentration, using the period from one to six hours, was 12.2 mg. per 100 cc. per hour for dog A, and 14.4 mg. per 100 cc. per hour for dog C—values in line with previous experience in this laboratory and elsewhere. The blood acetaldehyde concentrations rose slowly during this period, at the end of which the blood alcohol concentration had still not fallen to the base line, being in the vicinity of 50 mg. per 100 cc. The final acetaldehyde concentration was 0.2 mg. per 100 cc. in dog A and 0.36 mg. per 100 cc. in dog C. Thus the findings of previous investigators that administration of alcohol raises the blood acetaldehyde concentration were confirmed, although the results were rather lower than the 0.75 mg. per 100 cc. found by Supniewski[10] in the dog after twice as large a dose of alcohol, and rather higher than the 0.1 mg. per 100 cc. found by Hald and Larsen[5] with a smaller dose.

Next, a slow intravenous infusion of acetaldehyde was given, a rate of 185 mg. per kg. of body weight per hour being chosen because this is the maximum rate at which this species has been shown to metabolize alcohol, and thus would be the maximum rate at which such metabolism might be expected to produce acetaldehyde in the body. There was an initial rapid rise in the content of acetaldehyde in the blood to around 1.5 mg. per 100 cc. with subsequent fall to values comparable to those after infusion of alcohol. It is difficult to account for this initial rapid rise and subsequent decline, which seems to indicate that it takes the body some time to attain full efficiency in acetaldehyde metabolism. When a slower infusion rate of 100 mg. per kg. of body weight per hour was used, equal to the rate of alcohol metabolism in these dogs, there was still an initial rise and later decline, but not to the degree that was observed with the faster rate. It can be said with some assurance that the rate of acetaldehyde metabolism is greater than the rates of infusion used in these experiments, and thus the rate at which acetaldehyde could be formed from alcohol metabolism.

The dogs were then given antabus in dosage rather greater than that recommended for man on a weight basis. They received, by mouth, 0.5 gm. the first day, 0.25 gm. the second, and 0.125 gm. daily thereafter. About a week elapsed after the initial dose before the first experiment with alcohol after antabus was done. This consisted of a repetition of the injection of alcohol in the amount of 1.0 gm. per kg. of body weight. On this occasion the rate of fall of blood alcohol concentration was 14.0 mg. per 100 cc. per hour for dog A and 10.8 mg. per 100 cc. per hour for dog C—well within the range of day-to-day variation in rate of alcohol metabolism. This confirmed the finding that the presence of antabus does not have any significant effect on the rate at which alcohol is metabolized. The blood acetaldehyde values showed a prompt rise to the vicinity of 0.6 mg. per 100 cc., fluctuated considerably, and by the end of six hours, while there was still a considerable concentration of alcohol in the blood, dropped to about 0.05 mg. per 100 cc. of blood, or to a level lower than when the same dose of alcohol was given without antabus. This experiment confirmed the rise in blood acetaldehyde after antabus and alcohol. It indicated further that the level maintained is quite inconstant, and may fall to a low level before all the alcohol disappears. The explanation of this is obscure.

Next, the slow infusion of acetaldehyde at the lower rate, 100 mg. per kg. of body weight per hour, was repeated while the animals were on antabus. There resulted a rise in blood acetaldehyde quite comparable to that seen in the previous experiment with alcohol, indicating that there is no essential difference whether the acetaldehyde is formed by the metabolism of alcohol in the body or is injected into the blood stream. On another occasion a more rapid infusion of acetaldehyde at 185 mg. per kg. of body weight was carried out, and on this occasion there was a progressive rise in blood acetaldehyde to the high figures of 2.0 mg. per 100 cc. of blood in dog A and 4.0 mg. per 100 cc. in dog C. This interference with the metabolism of acetaldehyde by antabus, although striking, is really not very great, since if no acetaldehyde metabolism took place at all, a blood acetaldehyde level of 111.0 mg. per 100 cc. would be expected at the end of the six-hour infusion, whereas the actual average concentration reached was barely 3 per cent of that level. Moreover, the blood acetaldehyde values dropped precipitately in the hour after the infusion ceased, indicating rapid metabolism of acetaldehyde even in the presence of antabus. That this interference, after administration of alcohol in the range reported by the Danish investigators, is sufficient to produce acetaldehyde concentrations great enought to cause symptoms identical with those of acetaldehyde administration has been conclusively demonstrated by the present work. It has also been shown that the effect of antabus is not an acceleration of acetalde-

hyde production, but rather a slowing of the metabolism of acetaldehyde, allowing it to accumulate in the tissues in higher than normal concentrations.

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Antabus in the Treatment of Alcoholism in a Private General Hospital

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SUMMARY

In 35 consecutive cases in which patients were admitted to a private hospital for alcoholism, antabus was contraindicated for eight patients and administered to 27. Sixteen patients, followed three to nine months, cooperated fully with treatment and did not return to use of alcohol. In four cases there was at least one episode of drinking, but the patients continued to cooperate with treatment and attained partial success. In seven cases, including three in which antabus was stopped because of organic disease, treatment was unsuccessful. Insufficient insight and lack of family cooperation accounted for four failures.

The presence of cardiovascular or hepatic diseases contraindicates antabus. As the test of reaction to alcohol after antabus has been given is hazardous, continuous supervision by nurse and physician throughout the test reaction is mandatory.

Sustained results depend upon psychotherapy, family cooperation, careful follow-up, and control of side-reactions to the drug.

Antabus as an antagonist to alcohol is not safe enough to permit general use of the drug.

PREVIOUS extensive experience with the conditioned reflex treatment, prolonged hospitalization with psychotherapy, and the utilization of Alcoholics Anonymous in the management of chronic alcoholism were disappointing from the standpoint of sustained results. This led the authors to investigate Antabuse.® The purpose of this presentation is to report initial clinical experience with antabus in the treatment of alcoholism in a psychiatric department of a general hospital.

As early as 1914 Koelsch[10] discovered that cyanamide produced sensitivity to ingested ethyl alcohol. The fungus *coprinus atramentarius* produces a similar effect.[6]

In 1948 Hald, Jacobsen, and Larsen[7] published preliminary reports in English on the sensitizing effect of tetraethylthiuramdisulfide (antabus) and its use in the treatment of alcoholism. They showed that patients taking appropriate doses of antabus invariably experience extreme physical discomfort following the ingestion of small amounts of ethyl alcohol. As a result of animal and clinical investigation, they attributed this reaction to increased production of acetaldehyde.[6]

After clinical application by these Danish investigators, Jacobsen and Martensen-Larsen[8] reported a high percentage of socially recovered patients, noting that "all persons with alcoholism who have consulted us were treated with antabus and no absolute contraindications have been seen thus far." However, deaths have been reported,[4, 9] with this treatment; and other investigators[1, 5] have listed a number of contraindications and precautions in selection of patients. An editorial[2] in the *Journal of the American Medical Association* summarized recent opinion: "It is apparent that treatment of alcoholism with antabus is far from being free from danger. It should be carried out only in the hospital with small doses of both the drug and alcohol and with all the facilities at hand for emergency resuscitation. The patient should be carefully observed for a number of hours after the acute reaction."

The treatment program used by the authors follows, in general, the recommendations of Glud.[5] As early as possible after the patient is hospitalized the responsible relative is interviewed in order to evaluate the probable extent of family cooperation and obtain a medical and psychiatric history. At this time the relative is informed as to the general nature of the treatment and the necessity of long-term cooperation.

During the first two days in the hospital the patient has complete physical and neurologic examinations along with interviews to establish his psychiatric status and to inform him of the principles of treatment. Intensive psychotherapy is continued throughout hospitalization. Complete blood cell count, serology, and urinalysis are routine. Electrocardiograms are taken if history or physical findings suggest cardiac difficulties. A high protein, high carbohydrate, low fat diet is supplemented by vitamin B complex. After at least two days, glucose tolerance and sulfobromophthalein tests are done. If no more than 15 per cent of the sulfobromophthalein is retained at 30 minutes and if other findings are within normal limits, and the patient's cooperation is assured, antabus is given according to the usual dosage of 2 gm. the first day, 1.5 gm. the second,

From the Department of Psychiatry, University of California; Herrick Memorial Hospital; and the A. E. Bennett Neuropsychiatric Research Foundation, Berkeley, California. We are indebted to Ayerst, McKenna & Harrison, Ltd.

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1 gm. the third, and 0.75 gm. on the fourth day. On the fourth day of antabus administration, the patient's reaction to alcohol is tested, under constant supervision of nurse and physician. This reaction demonstrates to the patient what will happen if he takes alcohol and proves to him that he cannot drink as long as he takes the drug.

After recovery from the reaction the patient is discharged from the hospital and given a supply of tablets and a card to carry. This card identifies him as a patient taking antabus and advises those concerned to notify the hospital in case of a reaction. The relative who helps with the treatment is also carefully instructed. The patient is told to return for a second test on the eighth day. Following the second test, an appointment is given for a psychiatric interview at the office in one week. Maintenance dosage of antabus (from 0.25 to 1 gm. daily) is adjusted to the patient, the amount depending upon the severity of the test reaction and the side-effects. Individual needs determine frequency of subsequent interviews and laboratory tests.

It has been found that individualized personal management enhances the success of treatment and not only avoids dangerous reactions but also overcomes anxiety and keeps up the patient's incentive to carry on.

The following is a preliminary report upon 35 patients referred during a period of six months for alcoholism or its complications. Many were referred by general practitioners or specialists. Some were admitted to the hospital in emergency, and others voluntarily sought treatment. All were private patients and therefore differed in social background and drinking habits from those ordinarily observed in clinics, yet all were very severe chronic alcoholics. All were of middle class background, living in close contact with their families. Although interpersonal relationships had often deteriorated because of the patient's alcoholism, none of them had been completely rejected by his family. No one nationality or religion predominated.

Ten of the 35 patients were admitted with severe complications in addition to chronic alcoholism. Four patients with delirium tremens and one each with acute hallucinosis, polyneuritis, bromide intoxication, arsenic poisoning (suicidal attempt) and cardiac failure were treated by usual clinical methods before evaluation for antabus. In eight cases treatment with antabus was contraindicated—in six primarily for psychiatric reasons, in two primarily because of organic disease. The principal psychiatric contraindication was lack of insight (inability to accept the need of treatment). The organic complications were congestive heart failure in one case and myocardial infarction in the other (see Table 1).

Of the 27 patients who met the criteria for treatment with antabus, 18 were men and nine were women. The age range was 30 to 58, with nine patients in each decade and a median age of 44. Seven had previously taken the conditioned reflex treatment at least once. Several had joined Alcoholics Anonymous. These patients have been followed three to nine months on treatment with antabus. Results were successful (continued cooperation and no return to alcohol) in 16 cases; partially successful (at least one episode of drinking but continued cooperation with treatment) in four cases; and unsuccessful (return to previous drinking habits or organic complications forcing discontinuance of the drug) in seven cases.

TABLE 1.—*Contraindications in 8 of 35 Patients Considered for Treatment with Antabus*

No insight or desire for treatment	3
No insight plus bromide addiction	1
No insight plus cirrhosis of liver	1
No insight plus arsenic poisoning	1
Heart disease	2
Total	8

The following case report is illustrative of successful treatment:

CASE REPORT

The patient, a white male 50 years of age, was admitted with delirium tremens and a history of alcoholism for 20 years. Under intensive treatment the delirium subsided in two days. Results of physical, neurologic, psychiatric, and laboratory examinations were satisfactory. Intensive psychotherapy and antabus were started on the sixth hospital day. Four days later the first test reaction was induced with 90 cc. of wine containing 18 cc. of ethyl alcohol and repeated in 20 minutes. The patient first flushed, then became pale, nauseated and anxious. The severe reaction included rapid fall in blood pressure to 44 mm. of mercury systolic and 0 diastolic, which did not change with oxygen inhalation and intravenous coramine. Sensorium remained clear. Six hours later the patient was completely recovered from the reaction and was discharged from the hospital. On the eighth day of antabus he was given a smaller amount of wine, and the reaction was less severe. Office psychotherapeutic interviews were continued. Drowsiness and lassitude were so severe that it was necessary, after four weeks, to reduce dosage to 0.25 gm. daily. Laboratory work repeated at monthly intervals showed no abnormality. After six months the patient continued to take antabus. He said that he had no desire for liquor and had not tried to drink.

Three of the seven patients for whom the treatment was a failure stopped antabus and returned to old habits, three developed organic complications which led to discontinuance of antabus and one did not cooperate with treatment and subsequently killed herself. With a minimal amount of social work, contact with every patient treated has been maintained. It is felt that success in the continued management depends upon establishment of good relationship with the relatives during the patient's hospitalization and regular personal contact with the patient. In the four cases in which patients returned to old habits, there was lack of family cooperation. That is, the patient had insufficient insight and was unable to maintain treatment, and no one in the family had sufficient control to have him continue taking antabus (see Table 2).

Contraindications to antabus have been outlined by Glud.[5] In the authors' experience the most fre-

Table 2.—*Reasons for Failure in Seven Cases*

Lack of cooperation by patient and family	4
Increased retention of sulfobromophthalein with onset of symptoms of liver disease after taking antabus	2
Toxic psychosis beginning three days after starting antabus	1
Total	7

quent organic complications have been cardiac and hepatic diseases.

Of four patients with heart disease, two who had electrocardiographic evidence of severe cardiac damage were rejected; two with minimal damage were treated with extreme caution, and in one of them the electrocardiograms taken during the test reaction indicated alarming increase in coronary insufficiency. Even in patients without cardiac disease, a fall in systolic blood pressure to below 70 mm. of mercury was observed. Hence the authors agree with other observers that disease of the cardiovascular system makes treatment dangerous.

As to liver disease, Voegtlin and co-workers,[11] comparing 17 liver function tests, found that the sulfobromophthalein test best indicates liver damage associated with chronic alcoholism. Although Glud[5] recommended that sulfobromophthalein retention in excess of 15 per cent should contraindicate antabus, the authors have not found this criterion entirely satisfactory. Problems involving liver function were encountered in eight cases. In one of these there were also psychiatric contraindications and antabus was not given. Two patients, treated for liver disease until function was improved, were then given antabus. One tolerated the drug but organic psychotic reaction developed rapidly in the other; it subsided after antabus was discontinued. Another patient with 30 per cent retention of sulfobromophthalein, who was first given antabus by his family physician against the advice of the authors, tolerated the drug well. That patient is included among those for whom successful outcome is reported in this series. Decreased liver function developed in four patients taking antabus: In the two without symptoms antabus was continued; in the other two it was discontinued because of toxic hepatitis and gastrointestinal dysfunction, respectively, with subsequent remissions.

So far, psychiatric factors more frequently than somatic disorders contraindicate treatment. If the patient entirely lacks understanding of his illness and his need for treatment, he will not take antabus. In the belief that the treatment must be entirely voluntary, six patients who did not recognize that alcohol was a problem for them were rejected. One of them was hospitalized primarily for treatment of bromide intoxication.

Until the status of this treatment is established, all danger involved in the test reaction should be carefully studied. As has been noted, alarming fall in blood pressure during a severe reaction is a frequent occurrence. Oxygen, although recommended, has little effect; nor has ephedrine or nikethamide been satisfactory. Ascorbic acid, recently recommended by Bowman,[1] has likewise failed in the authors' limited experience with it. These serious complications make absolutely necessary the constant attendance of doctor and nurse to recognize and combat them before they develop fully. As an added precaution, to prevent dangerous reactions, the amount of alcohol originally recommended for the test reaction has been substantially reduced and the rate of ingestion retarded.

In this series, direct side-effects of antabus were more common than was reported by Jacobsen.[8] Every patient complained of lassitude, often to the extent of interference with normal living. In some instances benzedrine (5 mg.) has proved effective in combating this lethargy, which is usually directly proportional to dosage. Dizziness, interference with taste, and impotence have been frequent. In some cases these effects have been so severe that the antabus dose was reduced to a level not therapeutically effective. A report by Edwards[3] that antabus alone partially inhibits cellular respiration offers a possible explanation of the side-effects.

The authors have found the induction of physiological antagonism to alcohol to be the most successful way of keeping the patients sober and thus permitting maintenance of psychotherapeutic contact with them. However, because of the hazards previously mentioned, antabus is not safe enough to permit general use of it as an antagonist until there is further research on safeguards, and further clinical experience.

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The Use of Antabus in the Therapy of Alcoholic Patients

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SUMMARY

Preliminary studies on the effects of antabus (tetraethylthiuram disulfide) in the therapy of alcoholic patients indicate that it is very valuable in providing a "chemical foundation" for sobriety, even in those with a severe, long term drinking problem. In the first 30 patients treated, a favorable degree of control of the alcoholism has been effected in approximately 80 per cent. When taken regularly the drug maintains in the patient a very high degree of sensitivity to alcohol, quickly producing a number of very distressing bodily reactions whenever even very small amounts of spirits are ingested. Because of its potential dangers, antabus should be used only after thorough clinical and laboratory studies in properly staffed institutions. It is contraindicated in individuals with existing major psychosis or drug addiction and must be used only with caution in patients with diabetes mellitus, cardiovascular disease, goiter, pregnancy, epilepsy, asthma, and hepatic disease. Antabus therapy should be considered only one aspect of the total treatment program for the alcoholic patient.

PERHAPS the greatest difficulty in the treatment of the alcoholic patient is that often he will not remain sober long enough to undergo any real therapy. Some authorities have therefore stated that a minimum of six months to one year of hospitalization is required to lay a foundation before allowing the patient to return to his usual environs and continue treatment. Others have used conditioned reflex (aversion) therapy, first with apomorphine and later with emetine, with varying degrees of success; but this method depends on the after-effects of a short period of conditioning.

About two years ago in Denmark two physicians discovered more or less accidentally that tetraethylthiuram disulfide, or antabus, when ingested prior to drinking would chemically sensitize the individual against alcohol.[2] Since then over 10,000 problem drinkers have been treated with this drug in this country and abroad, under pretty carefully controlled conditions for the most part.[1, 3, 4]

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Antabuse® was supplied through the courtesy of Ayerst, McKenna and Harrison, Ltd., New York.

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INDICATIONS

Since in almost every alcoholic a combination of pharmacodynamic and psychodynamic factors is encountered, no single therapeutic approach is usually effective, but instead a comprehensive program is required. However, it can now be stated that the antabus regimen offers a pretty good "insurance policy" for sobriety in the majority of these patients. Therefore, the author has been using it in almost every case except where the alcoholism is relatively mild or is strictly secondary to a well-defined psychiatric disorder that necessitates primary attention. For example, a person using alcohol mostly in reaction to some acute situational stress might not require antabus, at least as a long-term program.

Of course, the interest in antabus on the part of the public as well as physicians has been rather thoroughly aroused. The manufacturers of the drug reportedly have been receiving 500 inquiries a month about it. The idea of overcoming a very expensive, disabling disorder like alcoholism "by taking a few pills" has fired the imagination of many a worried relative as well as that of many unhappy victims of the condition. Unfortunately, a little reflection makes evident that it is not nearly so simple as that, for the use of the drug is only one component of the therapeutic program.

CONTRAINDICATIONS

For the most part, these are relative rather than absolute. Two deaths have been reported in Europe in patients treated with antabus and suffering from diabetes mellitus, but other diabetics have been successfully treated without complications. Since in the alcohol reaction the cardiac rate and the cardiac output increase, the drug must be used cautiously in patients with cardiovascular disease. Opinion varies as to the use of antabus in patients with considerable liver damage, but the author has treated several such patients without incident, although care was taken to employ proper supportive measures of a nutritional and biochemical sort. Pregnancy has been considered a contraindication, although it is reported that a few gravid women have been successfully managed on the program, and at present the author is treating one in about the fifth month.

Perhaps the two most important conditions interfering with antabus therapy are psychiatric in nature—namely, drug addiction and definite psychosis. In the former case, the patient might take more and more of the habituating drug when deprived of alcohol; in the latter, the patient might use antabus for suicide or otherwise misuse the drug.

Asthma, nephritis, goiter, and epilepsy are other conditions which indicate a cautious approach to antabus therapy.

PRELIMINARY STUDIES

First of all, the alcoholic patient must have, of course, careful physical and neuropsychiatric examination. The author also employs comprehensive laboratory and biochemical studies. In addition to routine tests like blood cell count and urinalysis, serum calcium, phosphorus, glucose, cholesterol total and cholesterol esters, iodine, and bicarbonate levels are determined. A battery of tests are used to investigate liver function thoroughly: Cephalin flocculation. thymol turbidity, albumin-globulin ratio, serum alkaline phosphatase, serum bilirubin level, and sulfobromophthalein excretion rate. Blood acetaldehyde is measured before and after alcohol test reactions, since this is the constituent most affected by antabus and the one presumed to be most important in the sensitization mechanism. Electrocardiographic and electroencephalographic studies are carried out.

PROCEDURE

The alcoholic must be detoxified thoroughly and must be completely off alcohol for at least 48 hours prior to starting antabus medication. Usually he then is given three tablets within 24 hours and about 12 hours later two ounces of spirits is given to test the reaction. If the reaction is very slight, it is sometimes advisable to give an additional two ounces of spirits in one hour. Antabus is continued (one 0.5 gm. tablet at bedtime) and two additional reaction tests are ordinarily given at 48-hour intervals, using progressively smaller test doses of alcohol.

In a satisfactory reaction test, the patient usually shows a heavy flush within ten minutes after ingestion of 1 ounce of spirits, followed by heart-pounding, a feeling of constriction in the chest and throat, and often nausea, headache, and dizziness. The odor of acetaldehyde is almost always easily detectable. After one-half to one hour the patient often drops off to sleep.

It is important to emphasize the virtual necessity of the patient's experiencing two to three full-fledged reactions to alcohol under controlled conditions after being sensitized by intake of the drug. For him to learn about the reaction from hearing about it or even from seeing other patients experience it is usually not sufficient; he must actually undergo the process and in that way imprint the effects on the "feeling levels" of his own nervous system. After an adequate, or "Grade III," response, many an alcoholic verbally expresses a heartfelt aversion to spirits that surpasses any effects produced by conditional reflex therapy with emetine. More important than the psychological effect, perhaps, is the alteration in the pharmacodynamic factor, so that the patient often manifests a true indifference to alcohol even after returning to his usual environs.

Once the patient has experienced a satisfactory response, it is frequently feasible for him to return home with a limited supply of antabus and continue on an out-patient basis. He must continue to take the prescribed dose daily, under supervision by a member of his family if possible. So far the only relapses observed have occurred when the patient consciously or unconsciously neglected to take antabus for several days running. Then, since unbeknownst to him some antabus effect still remained, he often has given himself a painful surprise, becoming quite sick for 24 to 48 hours after ingesting several drinks. Usually by that time the patient is more than willing to return to the hospital and get back on the program.

CORRELATED THERAPY

Having given the patient a chemical foundation for abstinence, the other clinical problems that are usually found in the problem drinker must be dealt with. These are covered by psychiatric care as indicated, including group therapy; by nutritional and endocrine rehabilitation; and by appropriate efforts at social readjustment through counseling of the family and of the employer by the physician or psychiatric social worker.[5] It should be stressed that for most alcoholics antabus is not a therapy in itself but rather a valuable gateway to more fundamental treatment.

The need for appropriate psychotherapy along with medication in the case of the majority of problem drinkers has been emphasized by most of the workers in this line of research, including the Danish physicians who pioneered it. In the first place the alcoholic requires guidance and reorientation in his whole life program. Many alcoholics have profound emotional tensions which have been partly masked by alcoholism and which become in some ways even more disturbing when they are on the sobriety program. Although 40 per cent of problem drinkers are estimated to function pretty well through abstinence alone, the remaining 60 per cent show well defined neuroses or other psychopathologic conditions requiring therapy. In the case of the latter group, to supply antabus without correlated psychiatric treatment would be to treat only one symptom and to ignore the basic problems of the individual.

By the same token, the majority of the problem drinkers show a variety of physical ailments associated with alcoholism. In addition to the well-known anatomical disturbances like gross hepatic cirrhosis and polyneuropathy, more subtle nutritional and biochemical deviations are assuming greater and greater importance as techniques of investigation improve.[6] For instance, many patients have low glucose tolerance and a tendency toward hypoglycemia,[7] apparently on the basis of hypofunction of the adrenal cortex. This disturbance of course is associated clinically with symptoms like "jitters," tension, and fatigue—commonly blamed by some individuals for their inability to remain sober. In others unpleasant physical symptoms like tiredness and tension are associated with low blood iodine, high serum calcium, disturbance in the calcium-phosphorus ratio of the serum, and an elevated serum cholesterol—all associated with diminished thyroid function. In many patients, vague gastro-

intestinal complaints are found to be related to milder forms of hepatic dysfunction, reflected in low serum cholesterol, high serum alkaline phosphatase and serum bilirubin, increased cephalin flocculation and thymol turbidity, and the like. Obviously, such patients require intensive nutritional rehabilitation along with the antabus program.

EVALUATION OF RESULTS

It is too early to appraise the long-term effects of antabus, but initial results in a series of approximately 30 patients give much basis for cautious optimism. To illustrate, several patients with 15 to 25 years of chronic alcoholism and numerous prior hospitalizations with only very transient benefit are maintaining sobriety with antabus and making an adequate social and occupational adjustment with the help of correlated therapies. Many of these patients probably will have to continue this "insurance policy" for a long time to come, just as the diabetic must often continue insulin daily. In the series here under review, the therapeutic results thus far with antabus and correlated therapy have been substantially favorable in approximately 80 per cent of cases.

It is necessary, however, to sound a note of caution. Antabus should be considered a two-edged sword, since the drug is potentially toxic and improperly used might be disastrous. A long-suffering wife, for instance, might put a few tablets into the coffee of her bibulous spouse. Hardly less dangerous would be indiscriminate prescription by physicians without adequate clinical and laboratory investigation beforehand. At present it would seem essential to limit use of the drug to properly staffed institutions, where, of course, both in-patient and out-patient treatment might be undertaken.

ANALYSIS OF THERAPEUTIC FAILURES

About 20 per cent of the patients in this series have not been able to maintain sobriety for a significant period. In each case, of course, the patient quit taking antabus. This points up one of the chief paradoxes in the problem of alcoholics—namely the strong (but largely unconscious) wish to fail or relapse coexisting with the often desperate, conscious desire to overcome the illness. Naturally, this same conflict is present in other psychiatric conditions but rarely to the intense degree found in the average problem drinker. This unconscious drive to disaster has been variously explained. Freud formulated an elaborate if not easily credible theory about a "death instinct." Karl Menninger has written extensively along these lines, referring especially to the "chronic suicide" of the alcoholic. Taking a somewhat different point of view, Bergler has emphasized the role of super-ego tension and the compulsion for self-punishment. From his own observations the author inclines toward the theory that the alcoholic constantly is unconsciously striving to recapture the infantile feeling of omnipotence. Closely related is his "chaos drive," or the need to smash everything to pieces, overwhelm and engulf his environment — much as the infant sends his blocks flying in all directions. The alcoholic is notorious for his inability to follow a regular program, especially one involving self-discipline. Under the pressure of responsibilities in the adult world he has strong drives to "kick over the traces" and smash everything up, including himself. This phenomenon seems to account for the apparent lack of capacity of some of the patients in this series to take a little white pill daily, even though failure to do so jeopardizes everything they consciously hold dear. To combat this aspect of the problem in this group of patients intensive deep-level psychotherapy, supplemented by special accessory techniques, seems to offer the best hope of amelioration. Of course, each time the alcoholic suffers a painful relapse, a certain amount of the reality principle may be driven home to him.

ILLUSTRATIVE CASES

CASE 1: A 54-year-old accountant was admitted to the Sierra Madre Lodge on December 28, 1949, in a heavily intoxicated condition. After detoxification with insulin, intravenous fluids, and endocrine support, thorough clinical evaluation revealed an underlying psychoneurotic tension state of severe degree along with moderate nutritional depletion. Life history revealed an overconscientious, obsessively worrisome and insecure person who had always overextended himself in his occupation to secure approval. Chronic gastrointestinal complaints of 35 years' standing seemed primarily related to a mixture of anxiety and suppressed resentment. Alcohol had been taken in progressively greater quantities during the past 20 years for sedation and escape, until a well-established secondary addiction had developed. The patient began to lose time from work, sporadically had a few days' treatment in "sobering up" sanitaria, and finally was dismissed from his job despite an otherwise excellent work record.

After proper study, this patient was started on antabus and correlated psychiatric therapy, in which sodium pentothal narcoanalysis was particularly effective. Within eight days after admission he had improved sufficiently to leave the hospital and continue on an out-patient basis. He has remained sober to date, takes antabus regularly, and claims no desire to drink. Perhaps more hopeful is the pronounced reduction in emotional tension and associated gastrointestinal disturbances. The patient secured a better job in a bank after the bank president convinced himself of the kind of rehabilitation this patient seems to have embarked on.

It is believed that for good long-term results, the patient will have to continue antabus for a minimum of two years, with periodic psychiatric interviews and occasional narcotherapy.

CASE 2: A 37-year-old professional man began the antabus program in September 1949. He was considered a primary addict of severe degree, having been a problem drinker since first touching alcohol at age 15. The history included several arrests for drunkenness and between 40 and 50 periods of hospitalization in a dozen sanitaria. No therapy seemed to have made any real impression, including office psychotherapy, the Alcoholics Anonymous program, emetine aversion therapy on four occasions, and the combined entreaties and exhortations of friends and relatives. Accordingly, the patient begged for antabus and reacted so thoroughly to the third alcohol reaction test that he acquired a very healthy fear of its effects, in contrast to the transient impression of emetine.

After graduating to out-patient status in one week, the patient did well for about the next three months. He was strongly urged to have comprehensive follow-up treatment, in the way of reeducative psychotherapy and nutritional correction. He cooperated at first but pleaded increasing difficulty in keeping appointments because of the pressure of business. A few days before Christmas the patient's wife reported he was drinking again. A few hours later the patient himself made an appeal to be readmitted to the sanitarium, averring that he was sicker than he had ever been in his life. After he had been rescued, he related that he had not taken antabus for seven days (missing the first two days "unconsciously" and the remainder intentionally) and had expected to "celebrate the holidays with a little drinking before returning to the program." However, he still retained enough antabus sensitization to cause profound reaction so that there was not even temporary enjoyment in drinking. Since that brief escapade the patient has had his business partner administer the prescribed medication to him daily and has remained entirely abstinent and regularly at work. To his friends and associates this sobriety borders on the miraculous, but to his physicians the basic emotional immaturity of the patient and the related tensions severely interfere with his functioning anywhere near his potential capacities. Later, when more receptive, this patient will require more psychiatric therapy, and in the meantime his "chaos drive" is apt to disrupt an already unstable equilibrium. On the other hand, each day that he remains sober on antabus is that much on the credit side of the ledger from many standpoints and should not be lightly dismissed.

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Discussion by NICHOLAS A. BERCEL, M.D., *Los Angeles*

Since the psyche is a public domain, the psychiatric specialist is confronted by laymen's opinions to a much greater degree than let us say a surgeon, whose province is not open to public inquiry. It is for this reason that psychiatrists had to take a considerable amount of public beating because even though they have hammered into the public mind monotonously that alcoholic patients need psychotherapy, their record of success, let us face it, was a poor one. Many psychiatrists went even as far as to surrender the alcoholic case material into the hands of laymen's organizations, which did not help in promoting public confidence in the efficacy of psychological treatment in general. Chief reason for this abyss existing between theory and practice is that the alcoholic patient is like a castle surrounded by a moat over which, up to recently, no bridge could carry us. The best conceived therapeutic program was of no avail as long as the patient was inaccessible, as long as we could not keep him sober between two visits.

The treatments based on antagonism or aversion to which antabus therapy has been added of late, perform the function of the bridge. Alcoholics are now within our reach. As the speaker so carefully emphasized, however, antabus is only one part in an integrated strategy of total push.

The available clinical evidence can be accepted with justifiable optimism. At first glance, the practice of relying on the alcoholic for taking his daily tablet seems to be a handicap. The temptation of not taking the tablet appears to be too great. On second analysis, however, the active part that the alcoholic patient has to take every day in his salvation program represents a daily renewed insurance policy, just as there are people who while unable to lay aside a fraction of their income *every month*, by putting pennies *every morning* in a "piggy bank" succeed in saving up a fortune.

Another advantage of antabus seems to lie in the fact that if an alcoholic is tempted to "beat" the untoward effect of antabus therapy by ingesting a whopping dose of alcohol he is likely to pass out before he has a chance to ponder over the success of his endeavor. Learning from bad experience is not necessarily a bad teacher. The most appealing feature of antabus therapy, however, is its psychological soundness and the opportunity that it offers to study the biochemistry of alcohol metabolism in the body.

I think the speaker deserves our congratulations for lifting our spirits and for the restraint with which he tried to keep this lift within bounds.

A Survey of the Results of Treatment of Gastric Cancer in San Francisco

JOHN L. WILSON, M.D., *San Francisco*

SUMMARY

A survey was made of all patients treated for gastric cancer on the clinic services of the Stanford University Hospital during the 30-year period 1919 to 1948. During the last decade of the survey there were impressive gains in the surgical treatment of this disease. It was possible from 1944 to 1948 to do a gastric resection on half the patients seen with cancer of the stomach. Also, there was a pronounced decrease in resection mortality so that from 1939 to 1948 the mortality rate for subtotal gastrectomy for cancer was 3 per cent.

The over-all five-year survival rate was discouragingly low—4.6 per cent. On the other hand, 23 per cent of those surviving gastric resection lived for five years.

A survey of the management of carcinoma of the stomach from 1939 to 1948 was made in 11 general hospitals in San Francisco. A wide range of resectability and resection mortality rates was observed. The cases from these hospitals were combined with those from Stanford for the same period to form a composite group of 1,128 patients. Analysis of this group of cases from 12 representative hospitals in San Francisco showed encouraging trends toward higher resectability rates with a lower resection mortality.

GREATER success in the treatment of gastric carcinoma depends upon earlier diagnosis and more effective surgical excision. The difficulties of early diagnosis are well known and will not be discussed here. Most laymen and many physicians are overly pessimistic regarding the hazards of operation for gastric cancer. If it can be shown that surgical methods have been greatly improved in recent years, it should be well worthwhile and may even prove influential in bringing more cases to early operation.

This study will present, first, the changing picture of surgical treatment of gastric cancer over the 30-year period from 1919 to 1948 as exemplified by the experience on the clinical service at Stanford University Hospital. Second, since it is believed that a truer picture of the present management of gastric cancer in the community as a whole can be so obtained, the operability, resectability and resection mortality rates in 11 other San Francisco hospitals for the last decade (1939 to 1948) of the above period have been determined.

From the Department of Surgery, Stanford University Medical School, San Francisco.

Presented before the Section on General Surgery at the 79th Annual Meeting of the California Medical Association, April 30-May 3, 1950, San Diego.

OBSERVATIONS AT STANFORD

Every effort will be made to present the data obtained from these surveys in such a way that they may be readily compared with those reported from other sources. The comprehensive studies of gastric carcinoma by Livingston and Pack[3] and by Walters, Gray and Priestley[8] have established a pattern which will be followed.

Source of the Material. The clinical material studied consists of all cases of gastric carcinoma (310 patients) admitted to the clinic services of the Stanford University Hospital during the 30-year period from 1919 to 1948. This group of 310 patients is the basis for the following estimates of operability, resectability and resection mortality rates.

Operability. Operability rates in gastric cancer are in general a reflection of the stage of the disease

TABLE 1.—*Summary of Treatment of Gastric Cancer at Stanford 1919 to 1948, Inclusive*

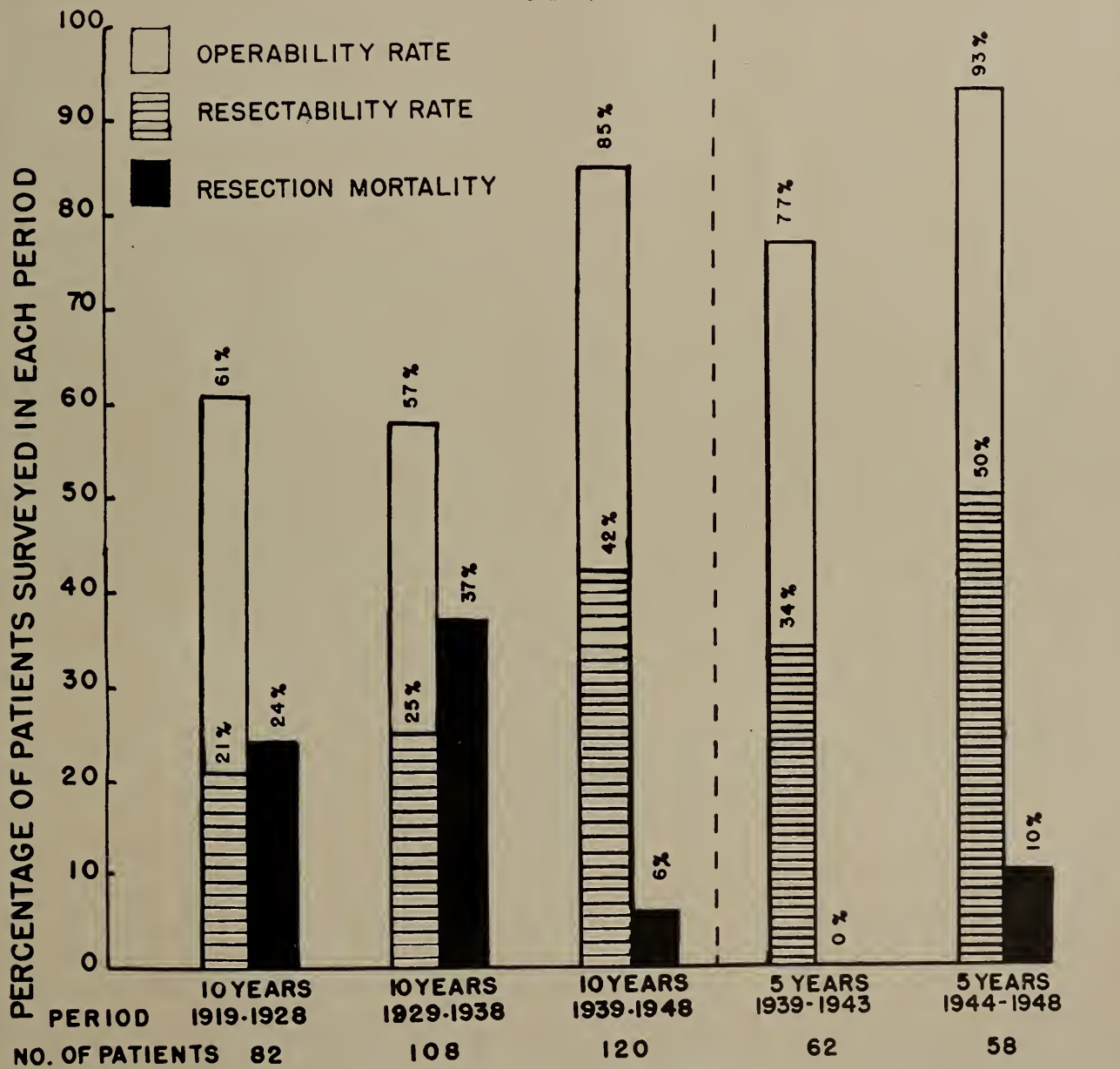
	1919-1928	1929-1938	1939-1948
Number of cases	82	108	120
Number of patients operated upon	48	62	102
Laparotomy only:			
Number of cases	19	21	32
Per cent of total cases	23%	19%	27%
Operative mortality	5%	9%	16%
Palliative procedures:			
Gastroenterostomy:			
Number of cases	12	13	17
Per cent of total cases	17%	12%	14%
Operative mortality	0%	23%	12%
Gastrostomy:			
Number of cases	0	1	3
Per cent of total cases	..	1%	2%
Operative mortality	..	0%	67%
Resections:			
Subtotal resections:			
Number of cases	17	27	38
Per cent of total cases	21%	25%	32%
Operative mortality	24%	37%	3%
Resections of cardia:			
Number of cases	0	0	8
Per cent of total cases	..	..	7%
Operative mortality	..	..	25%
Total resections:			
Number of cases	0	0	4
Per cent of total cases	..	..	3%
Operative mortality	..	..	0%
Operability rate	61%	57%	85%
Resectability rate	21%	25%	42%
Resection mortality rate (for resections of all types)	24%	37%	6%

at the time of diagnosis, but an aggressive surgical attitude is also an important factor in bringing more patients to operation. Operability rates remained relatively the same for the first two decades of the 30-year period but there was a pronounced trend toward higher operability rates between 1939 and 1948. Operability rates by decades from 1919 to 1948 were 61 per cent, 57 per cent and 85 per cent. In the last five years of the survey the operability rate reached the high level of 93 per cent (Table 1 and Chart 1).

Exploratory and Palliative Operations. Table 1 gives the incidence of exploratory and palliative operations by decades. Follow-up studies showed that patients with inoperable carcinoma of the stomach had an average survival of less than two months after discharge from the hospital. For those patients who had only laparotomy the average period of survival was less than three months. For those having a palliative procedure the average duration of life was less than seven months. Partial gastrectomy was not used as a palliative procedure in this series of cases.

Resections. During the first two decades of this study all resections were subtotal gastrectomies of the distal stomach. In the third decade, 1939 to 1948, there were 38 subtotal gastrectomies, eight resections of the cardiac portion of the stomach and

Chart 1.



OPERABILITY, RESECTABILITY AND RESECTION MORTALITY IN GASTRIC CARCINOMA AT STANFORD 1919–1948

LAST 2 COLUMNS, DIVISION OF LAST DECADE OF SURVEY INTO TWO 5-YEAR PERIODS

four total gastrectomies. The resectability rates (based on all cases observed) by decades were 21 per cent, 25 per cent and 42 per cent. During the last five years of the 30-year period, 50 per cent of the patients observed with carcinoma of the stomach had gastric resection (Chart 1).

Resection Mortality. As has been the experience reported from other clinics, there has been a sharp decline in resection mortality in recent years. During the first two decades of this survey the resection mortalities were 24 per cent and 37 per cent. In the third decade (1939 to 1948), however, there were 50 resections of all types with only three deaths, a resection mortality of 6 per cent. Two of the three deaths occurred after resections of the cardia and only one (due to mesenteric thrombosis) followed subtotal gastrectomy.

In the 30-year period there were 94 resections for gastric carcinoma with 17 deaths. The causes of these 17 post-resection deaths are listed in Table 2 by decades. Peritonitis was the commonest cause of death, but in this series there was no death from peritonitis after 1937. The sharp decline in the mortality rate for gastric resection is the result of many factors which are almost impossible to evaluate individually. Improved pre- and postoperative management, based on a better understanding of the physiological disturbances in the surgical patient, has helped make resection safer. Antibiotics and frequent whole blood transfusions are powerful supportive measures now frequently used. Finally, it is noteworthy that records of patients operated upon in the last decade of the survey period show disappearance of post-resection peritonitis and intestinal obstruction, complications related in large measure to operative technique.

It was suggested by Wangensteen and co-workers[6] that use of the aseptic technique in gastric resection was in part responsible for the improved mortality statistics in the University of Minnesota Hospital. Holman[1] also stressed the importance of aseptic gastric resection for carcinoma and has described the technical steps of this procedure as done at Stanford. Twenty-seven of the 50 resections done for gastric cancer at Stanford during the decade 1939 to 1948 were aseptic in type. The pronounced reduction in post-resection mortality was coincident with the frequent use of the closed resection technique, but the record for open resections during this decade also improved. Declining mortality rates for subtotal gastrectomy have been reported from clinics which employ the open technique of resection almost exclusively.[5, 9] It probably matters little whether the resection is open or aseptic in type as long as it is carefully done in accordance with sound surgical principles.

The operability, resectability and resection mortality rates here reported are more easily evaluated when they are compared with similar percentages from other institutions listed in Table 3. Statistics for earlier periods may be found in the surveys of Livingston and Pack[3] and Maimon and Palmer.[4]

Survival Rates. It was possible to obtain complete follow-up information on 297 patients or 96 per cent of the original group of 310. It is the group of 297 completely followed patients which serves as the basis for the estimation of survival rates.

The three, five and ten-year survival rates, based on all cases followed, were respectively 8.5 per cent, 4.6 per cent and 1.1 per cent (Chart 2). Table 4 lists for comparison the survival rates reported by several investigators.

The location of the lesion in the stomach of the 20 Stanford patients surviving more than three years is shown in Figure 1. All except one of these lesions was in the distal half of the stomach. This is due to the fact that during the first 25 years of this 30-year survey only lesions in the distal portion

TABLE 2.—*Causes of 17 Postresection Deaths at Stanford, 1919 to 1948*

First Decade—1919-1928		Second Decade—1929-1938		Third Decade—1939-1948	
Cause of Death	No. Deaths	Cause of Death	No. Deaths	Cause of Death	No. Deaths
Peritonitis	4	Peritonitis	4	Empyema	1
		Intestinal obstruction	3	Mesenteric thrombosis	1
		Pulmonary complications	1	Cause undetermined	1
		Shock	1		
		Cause undetermined	1		
Total deaths	4		10		3

TABLE 3.—*Operability, Resectability and Resection Mortality Rates for Gastric Cancer in Various Hospitals*

Hospital	Period	No. Cases	Operability Rate	Resectability Rate	Resection Mortality: Subtotal Gastrectomy	Resection Mortality: Total and Gastric Cardia Resections
Mass. General Hospital*[9]	1937-1946	832	76%	50%	11%†	27%
Univ. of Minn. Hospital[6]	1936-1945	586	76%	52%	15.2%†	30%
Memorial Hosp., New York[5]	1936-1945	683	79%	35%	12.2%†	30%
Stanford Univ. Hospital	1939-1948	120	85%	42%	3%	17%

* Calculations made from authors' statistics.
† In these hospitals partial gastrectomy was used frequently as a palliative measure. This accounts for poorer risks and higher mortalities.

of the stomach were considered resectable. Carcinoma of the cardia and fundus can now be safely resected and future reviews from Stanford may show an increasing number of long-term survivors of lesions involving the proximal half of the stomach.

A more hopeful and, some contend, more realistic estimate of the value of surgical treatment can be obtained by determining survival rates in the group of patients who survive resection. At Stanford, the three, five and ten-year survival rates of patients surviving resection of a gastric carcinoma were 35 per cent, 23 per cent and 8 per cent (Chart 3). In Table 5 are listed for comparison the percentages of five-year survivors after resection as reported elsewhere.

If, in the future, gastric resection can be done on half the patients seen at Stanford with cancer of the stomach and if, as in the past, at least one-fifth of those surviving resection live five years, then the over-all five-year survival rate should rise from 4.6 per cent to about 10 per cent. This simple calculation suggests that it may be possible with present methods of treatment to double the percentage of five-year survivors of gastric carcinoma.

The series of cases reported here is comparatively small and the percentages quoted are based on too few cases to have great weight. However, there is no question that these studies clearly demonstrate the same encouraging trends toward more and safer resections of gastric cancer which are being reported from other clinics.

TABLE 4.—*Survival Rates in Gastric Cancer*

Source	Period	Survive 3 yrs.	5 yrs.	10 yrs.
Livingston and Pack[3]	1881-1931	3.2%	1.9%	0.7%
Mass. General Hospital[9]	1937-1941	....	7 %	....
Univ. of Minnesota Hosp.[6]	1936-1943	10.7%	6.6%	....
Stanford University Hosp.	1919-1945	8.5%	4.6%	1.1%

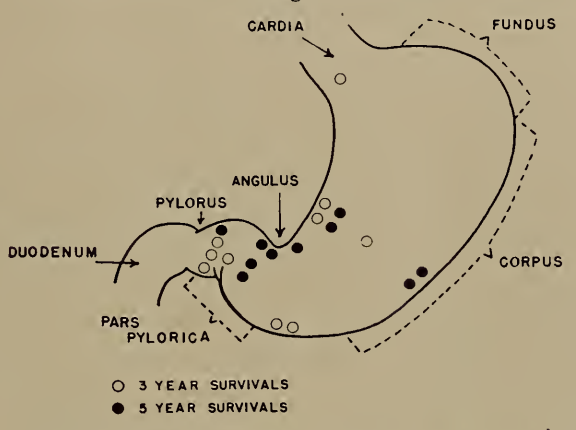
SURVEY TREATMENT OF GASTRIC CANCER IN ELEVEN SAN FRANCISCO HOSPITALS

The various university hospitals and special clinics throughout the world make periodic reports on their management of carcinoma of the stomach. From their data it is possible to draw conclusions as to the results of treatment in these specific institutions that are, in fact, the pilot plants in which new concepts and techniques of treatment are de-

TABLE 5.—*Survival Rates in Patients Surviving Resection of Gastric Cancer*

Source	Survive 3 yrs.	5 yrs.	10 yrs.
Livingston and Pack[3]	29.1%	18.9%	10.7%
Univ. of Minnesota Hospital[6]	29.4%	21.5%	....
Memorial Hospital, New York[5]	....	34.7%	....
Stanford University Hospital	35 %	23 %	8 %

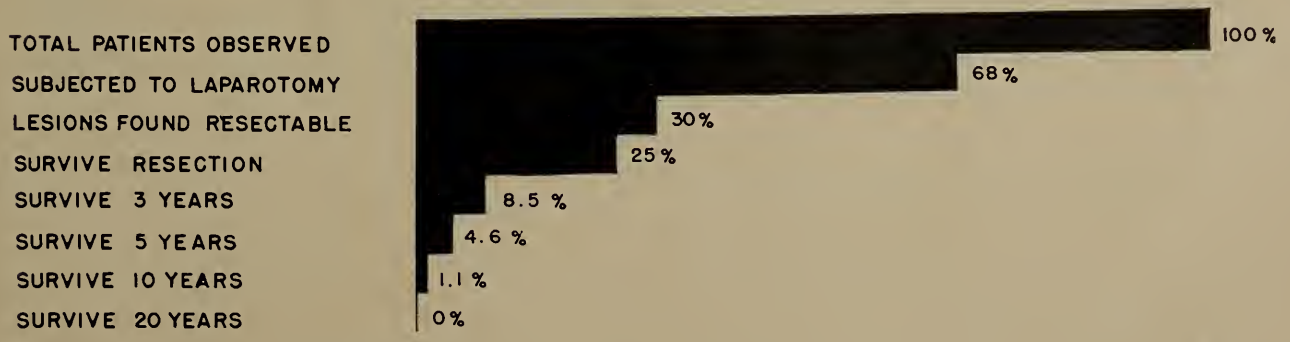
Figure 1.



LOCATION OF LESION IN PATIENTS SURVIVING 3 AND 5 YEARS

Chart 2.

SURVIVAL RATES OF PATIENTS TREATED FOR GASTRIC CARCINOMA AT STANFORD

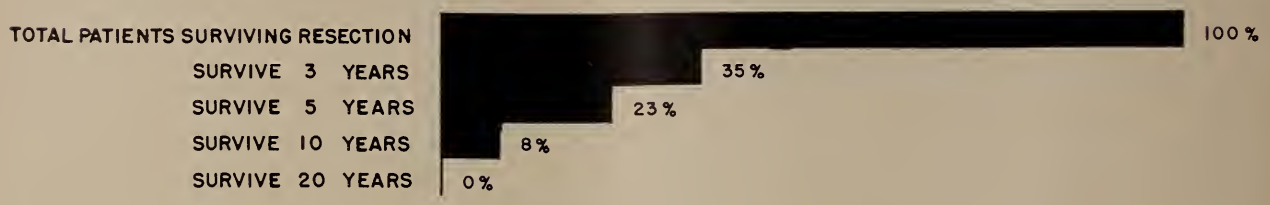


Period of Study	Total No. of Patients Seen	Survivors	Survival Rate
1919 – 1945	258	22 patients survived 3 years*	8.5 per cent
1919 – 1943	237	11 patients survived 5 years	4.6 per cent
1919 – 1938	176	2 patients survived 10 years	1.1 per cent

*Twenty of these patients had gastric resection. The other two patients had gastric cancer proved by laparotomy, were considered not resectable, but lived 3 7/12 and 3 11/12 years after operation before dying of carcinoma of the stomach.

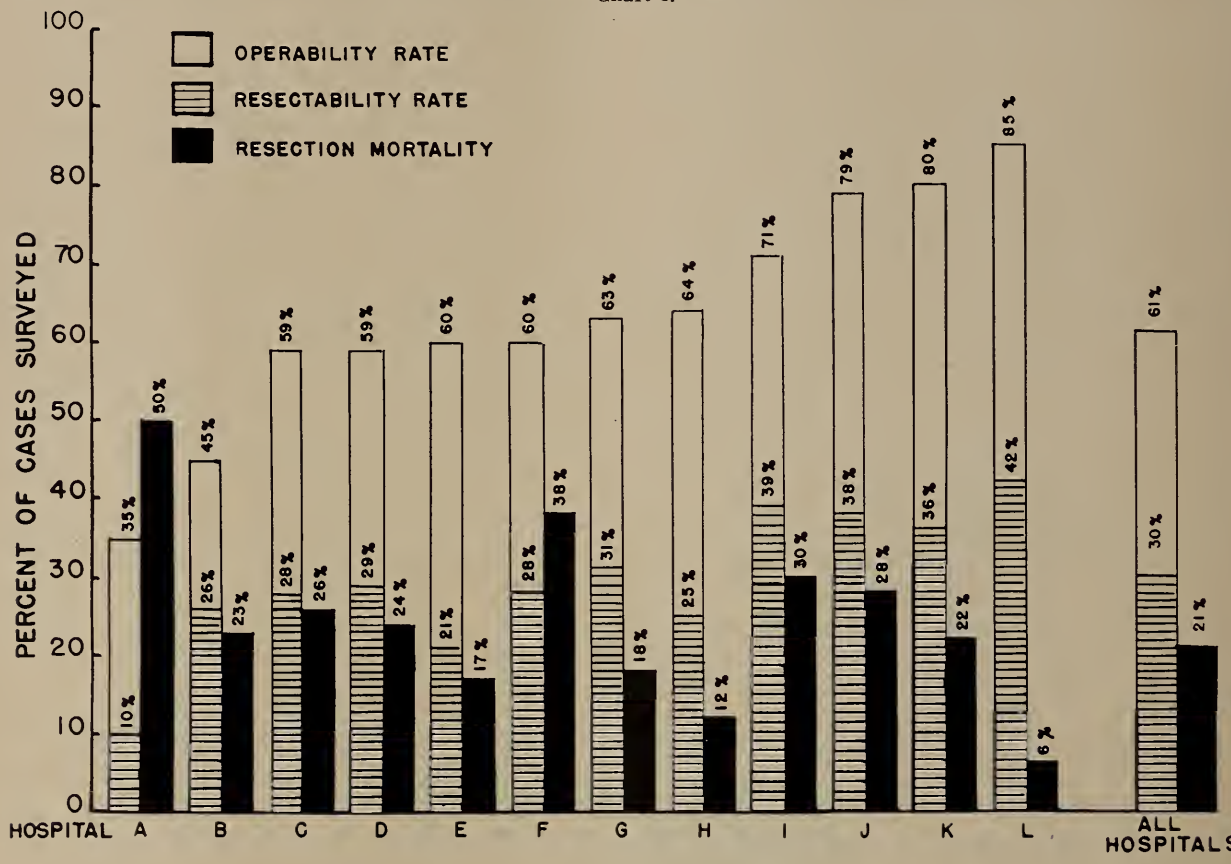
Chart 3.

SURVIVAL RATES OF PATIENTS SURVIVING RESECTION OF GASTRIC CARCINOMA AT STANFORD



Period of Study	Total No. Patients Surviving Resection	Survivors	Survival Rate
1919 – 1945	58	20 patients lived 3 years after resection	35 per cent
1919 – 1943	47	11 patients lived 5 years after resection	23 per cent
1919 – 1938	26	2 patients lived 10 years after resection	8 per cent
1919 – 1928	11	No patients lived 20 years after resection	0 per cent

Chart 4.



OPERABILITY, RESECTABILITY AND RESECTION MORTALITY RATES IN 12 SAN FRANCISCO HOSPITALS, 1939 - 1948

L = STANFORD HOSPITAL

ALL HOSPITALS	
1128	CASES
705	OPERATIONS
338	RESECTIONS
72	DEATHS AFTER RESECTION, ALL TYPES

veloped. It is to be expected that for many reasons there will be a certain lag in the acceptance and application of these changing attitudes and methods in the general hospitals of the community. Thorstad[7] called attention to the importance of considering the results obtained in these general hospitals when seeking a true picture of the treatment of gastric cancer throughout the country. Accordingly, he reported the resectability rate for gastric cancer in the Harper Hospital, Detroit, from 1928 to 1942 to be 19.4 per cent and the resection mortality to be 64.7 per cent. For the same period the Detroit Receiving Hospital had a resectability rate of 9.8 per cent and a resection mortality of 57 per cent. These

results were considerably less satisfactory than those reported from many special centers for the same period and served to emphasize his point that such local surveys are useful in obtaining a candid view of the prospects of the average patient with gastric cancer.

It was in the interest, then, of getting a broader and more realistic idea of the management of gastric carcinoma in the community as a whole that a survey was made in 11 of the general hospitals of San Francisco for the ten-year period 1939 to 1948. The staffs of the following San Francisco hospitals made available the data on their cases of gastric carcinoma:

Hospital	Beds[2]
Children's Hospital (for women and children)	250
Franklin Hospital	250
French Hospital	225
Mary's Help Hospital	172
Mount Zion Hospital	163
St. Francis Hospital	300
St. Joseph's Hospital	238
St. Mary's Hospital	371
San Francisco Hospital*	1,336
Southern Pacific Hospital	450
U. S. Veterans' Hospital, San Francisco	396

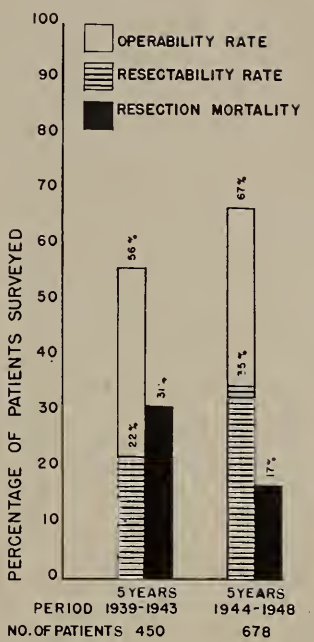
The results of this survey are summarized in Chart 4. In the 11 general hospitals surveyed the operability rates ranged from 35 per cent to 80 per cent. Resectability rates varied from 10 per cent to 39 per cent and the mortality for resections of all types varied from 12 per cent to 50 per cent. In these 11 hospitals 26 total gastrectomies were done with nine deaths, a mortality of 35 per cent.

It is not the purpose here to compare the management of gastric cancer in the general hospitals of the community with that on a university service. Instead, the primary interest has been in gathering together data on a large series of cases treated in a wide variety of hospitals and by numerous different surgeons in the same city. An analysis of such a series of cases will then give some insight into the status of the management of carcinoma of the stomach in the community as a whole. For this reason the cases treated in the 11 hospitals listed and on the clinic service at Stanford from 1939 to 1948 have been combined. A composite group of 1,128 cases of gastric carcinoma treated in 12 representative San Francisco hospitals was thus formed. In this group there were 425 inoperable and 705 operable cases with 338 resections and 72 post-resection deaths. For the decade 1939 to 1948 the over-all operability rate was 61 per cent, resectability rate 30 per cent and mortality for resections of all types 21 per cent (Chart 4).

There was a definite trend toward better resectability and resection mortality rates in the segment of the community surveyed. In order to show this

*The survey of the San Francisco Hospital was made possible by the cooperation of the San Francisco Department of Public Health and covers only the period from 1942 to 1948, inclusive. The Department of Surgery of the University of California Medical School very kindly permitted the inclusion of the cases from their services in this study.

Chart 5.



MANAGEMENT OF GASTRIC CANCER IN 12 SAN FRANCISCO HOSPITALS IN 2 CONSECUTIVE 5-YEAR PERIODS

trend the decade 1939 to 1948 was divided into two five-year periods as shown in Chart 5. It was found that the over-all resectability rate increased by more than one-third (from 22 per cent to 35 per cent) and the mortality for resections of all types was almost halved (reduced from 31 per cent to 17 per cent). These findings suggest that the outlook in the San Francisco community for the average patient with gastric cancer materially improved during the decade of the study. Literally dozens of different surgeons working in a dozen different hospitals in San Francisco have in recent years been able to achieve resectability and resection mortality rates which compare favorably with those reported from certain recognized medical centers (Table 3).

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Carcinoma of the Esophagus and Gastric Cardia

With Special Reference to Treatment

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SUMMARY

During the last five years the thoracic and abdominothoracic approaches in esophageal and gastric surgery have become established. With improvements in surgical and anesthetic technique mortality rates have declined. Preoperative and postoperative care are of great importance.

ONE of the most significant advances in surgery during the last decade is the transthoracic approach to lesions of the esophagus and gastric cardia.

The importance of this advance is apparent in the light of an estimate* that in 1946 5,869 persons had carcinoma at the esophageal and gastric cardia levels—lesions which, by previous clinical and roentgenologic standards, would have been classified as "inoperable." Thus, by a fortunate combination of advances in the fields of anesthesia, surgery, and preoperative and postoperative therapy, plus the availability of antibiotics, carcinoma at all levels of the esophagus and an additional estimated 10 per cent of carcinomas of the stomach now are accessible to surgical treatment. The significance of this advance is apparent when it is recalled that esophageal cancer is more common than cancer of the central nervous system, lip, tongue, mouth, pharynx, duodenum, larynx, thyroid, pleura and peritoneum, kidney, testes, and bone.

ANATOMY

In previous reports,[10, 11] it has been pointed out that investigators are not in agreement regarding the gross anatomy of the gastric cardia. This springs from the fact that the cardia is a physiologic sphincter rather than a gross anatomic structure. Histologically the cardia is a zone about five millimeters in width situated at the esophageal orifice of the stomach. It is lined by columnar epithelium containing mucous glands which resemble those of the pylorus. The significant distinction is that the mucous membrane of all portions of the stomach including the cardia is of the glandular type whereas the mucous lining of the esophagus is of the squamous epithelial variety. It is important that this distinction be made at the outset because significant pathologic and clinical implications will be discussed later in this presentation.

Despite these anatomic differences, malignant conditions existing in the gastric cardia and the distal esophagus present the same surgical problem. Because these structures are anatomically contiguous, the symptoms, diagnostic procedures and therapeutic approach are identical.

PATHOLOGY

The histopathologic characteristics and the mode of spread of malignant lesions arising in the esophagus are quite different from those of lesions originating in the cardia. Thus, carcinoma originating in the esophagus is of the squamous cell variety owing to the squamous type of epithelium from which it originates. Since the mucosa of the gastric cardia is of the glandular type, carcinoma which originates in this region is of the corresponding adenocarcinomatous variety. Adenocarcinoma of the stomach tends to spread to the esophagus by direct extension through the submucosal layer. Squamous cell carcinoma of the esophagus, on the contrary, spreads to the stomach by direct invasion on the one hand and by way of lymphatics to the paracardial lymph nodes on the other. An exception to these pathologic distinctions is the theoretic if not the practical possibility of the origin of adenocarcinoma from rests of gastric mucosa situated in the distal esophagus.

SYMPTOMS AND DIAGNOSIS

In cases of carcinoma of the esophagus and cardia the early symptoms usually are mild. In fact the patient, and too frequently the physician, assumes erroneously that they originate from functional or benign disturbance of the gastrointestinal, respiratory or circulatory system. Dysphagia is the earliest and usually the most important symptom. It is the result of obstruction to the passage of food or fluid through the esophagus and into the stomach. In the beginning it commonly is mild and transitory but usually it recurs or persists. Eventually regurgitation supervenes to relieve the dysphagia or obstruction. The patient's first visit to the physician often is deferred until this time.

Pain may be present but it is not usual. It usually develops late and as the result of infection or extension of the growth. In rare instances bleeding is the first symptom noted. When the patient presents

* Based on U. S. Public Health Service Vital Statistics.[12]

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himself early, alertness to the grave possibilities of mild symptoms is entirely the responsibility of the physician.

In the late stages, the most characteristic feature is progressive loss of weight. At this stage starvation usually causes pronounced lowering of the general morale.

Since many of the problems of surgical treatment of lesions at this level have been solved, the most important responsibility which devolves upon the family physician is diagnosis. In the author's experience, the most common error results from the acceptance of a negative report from one investigative procedure without utilizing other of the various diagnostic methods. Often this may be traced to economic considerations, additional diagnostic procedures being omitted in order to conserve the patient's funds. Another feature not to be overlooked is that in an age of specialization the limitations inherent in all special diagnostic procedures are not generally recognized. In many instances it is only by the combined use of fluoroscopy, esophagoscopy, gastroscopy and biopsy that these diagnostic problems can be solved.

The diagnosis of carcinoma may be made on the basis of a history of dysphagia with roentgenologic and/or endoscopic confirmation. While fluoroscopy usually is of the utmost value, it occasionally happens that the lesion escapes roentgenologic detection. In these instances diagnostic esophagoscopy or gastroscopy or both must be utilized. In cases in which close questioning reveals that the dysphagia is persistent or recurring and is associated with obstruction or a sense of delay retrosternally, diagnostic esophagoscopy is obligatory even though results of fluoroscopy are negative. (It is important, however, to keep in mind the possibility that the symptoms may be produced by suprasternal tension of so-called globus hystericus.) Positive biopsy furnishes valuable and final proof of malignancy.

SURGICAL APPROACH

The solution by surgical means of the problem of carcinoma occurring at the distal esophagus or gastric cardia has been accomplished through the expedient of the transthoracic approach, an outgrowth of the abdominothoracic attack on lesions primary in the gastric corpus, cardia and terminal esophagus. In fact, Phemister's[8] first successful single-stage esophagogastrectomy in 1938 was suggested by Ohsawa's[5] successful abdominothoracic operation five years previously. The value of the combined approach has been emphasized by Garlock[3] who enumerates several advantages: (1) Operability may be determined through a small upper left rectus incision before extending the incision to the thorax; (2) in no other way, prior to opening the thorax, may the surgeon determine the presence or absence of hepatic metastasis, fixation of the growth, the presence of peritoneal implants or extensive retroperitoneal involvement as, for example, the important area about the celiac axis.

The success of these new approaches is the result of a combination of important advances in anesthesiology, thoracic surgery, the care of the undernourished patient, the application of antibiotics and the understanding and handling of pulmonary and cardiovascular complications. The extensive exposure of the esophagus and proximal stomach not only permits surgical removal of lesions of the esophagus and proximal stomach but provides an opportunity for removal of involved lymph nodes and contiguous structures. In lesions of the stomach the new approaches permit choice between total gastrectomy on the one hand and, on the other, resection of the proximal stomach combined with the appropriate esophagojejunal or esophagogastric anastomosis. With respect to lesions of the esophagus, the newer approaches replace the Torek and other procedures wherein external restoration of gastrointestinal continuity is required.

PREPARATION OF THE PATIENT

It is important, when possible, to apply surgical treatment early, before loss of weight, anemia and malnutrition have progressed so far as to require prolonged periods for correction. If operation has been delayed, malnutrition and dehydration must be corrected by the administration of amino acids, glucose and electrolytes. Correction of severe hypoproteinemia may require prolonged delay. In such instances a choice must be made between this delay and operation before the depleted condition is entirely overcome. Anemia must be corrected by the administration of whole blood and appropriate doses of iron and liver extract. Vitamins B and C should be given for several days prior to operation. During the 24 hours before operation, massive doses of penicillin and streptomycin should be administered parenterally and 0.5 gm. of streptomycin given by mouth. The entire thorax and axilla must be prepared for operation and a Levin tube inserted as far as possible before the patient goes to surgery.

ANESTHESIA

The judicious use of the anesthetic agents and adjuvants currently available is indispensable to the successful conduct of open chest operations on the alimentary tract.

TECHNIQUE OF OPERATION

Whereas the history of the technique of operation has been published by Bird,[1] Ochsner and DeBakey,[4] and by Pack and McNeer,[6] Garlock[3] and Sweet[9] have contributed most to the standardization of technique. The author has pointed out elsewhere[11] that a feature of operation equal in importance to the transthoracic approach is the advancement of the stomach or jejunum into the thorax in order to complete gastrointestinal continuity. An addendum is applicable to that report: As early as 1895, Biondi performed transthoracic esophagogastrostomy on dogs through a "buttonhole" in the diaphragm. Apparently, therefore, he was first to advance the stomach into the thorax experimentally. In 1904, Mikulicz, operating upon a dog, advanced

the stomach into the thorax and the animal was in good health six weeks after operation. In August 1938, Cattell "reduced" the stomach into the thorax transperitoneally as a preliminary to subsequent successful transthoracic cardio-esophagectomy.

The essentials of the operation are thoracotomy or abdominothoracotomy with radical excision of a segment of the esophagus, of the proximal stomach, or both, or total gastrectomy with removal of the regional lymph nodes and restoration of continuity by esophagogastric or esophagojejunal anastomosis within the thorax or within the base of the neck.

Following is a brief outline of the technique of operation as utilized in cases reported later in this presentation. In the transthoracic approach the chest is opened, usually through the eighth rib bed. In high-lying lesions the chest may be entered either at the level of the fourth rib or exposure facilitated by division of the seventh, sixth, fifth and as high as the fourth rib. Pleural adhesions, if present, are divided and the left thorax is explored. The judicious use of curare has eliminated the necessity of avulsion, division or crushing of the phrenic nerve in order to overcome its resistance of or the transmission of abdominal tension through the diaphragm. Through an incision in the posterior mediastinum, the distal esophagus is explored manually and involvement of mediastinal lymph nodes noted. The distal esophagus then is mobilized over a Penrose drain.

Some indication of the extent of intra-abdominal involvement may be obtained by palpation through the relaxed diaphragm. Usually, however, it is necessary to incise the dome of the diaphragm. This permits manual exploration of the regional lymph nodes, the liver and the peritoneal surfaces. Should non-resectability be apparent, the operation may be concluded by closure of the diaphragm, the mediastinum and the thoracic cage. If resection of the lesion appears possible, the upper abdominal and left thoracic regions are converted into a single cavity by extending the diaphragmatic incision in either direction as well as through the esophageal hiatus. Resection of the primary lesion with the regional lymph nodes then is carried out with due consideration of the gastric and esophageal blood supply. After the incision in the distal retained portion of the stomach is closed, that organ is advanced into the thorax where end-of-the-esophagus to side-of-the-stomach anastomosis is completed by use of three layers of interrupted silk sutures. The stomach is fixed to the mediastinal and parietal pleura so that it becomes a thoracic organ permanently in whole or in part. The incision in the diaphragm then is closed by suturing it loosely to the stomach wall so as to avoid constriction. In this way the symptoms characteristic of esophageal hiatal hernia are avoided.

When total gastrectomy is required, the esophagus is anastomosed to a loop of jejunum which has been advanced into the thorax. Jejunojejunostomy should be added.

The abdominothoracic approach is extremely valuable for lesions situated primarily in the corpus but with involvement of the cardia and with extension to lymph nodes or other organs below or above the diaphragm. Operability is determined by means of a preliminary incision through the outer margin of the left rectus abdominis. This permits systemic palpation of the stomach, liver, suprapyloric, supragastric, paracardial, pancreaticolienal, middle colic and infrapyloric lymph nodes. Thus the presence or absence of hepatic nodules, peritoneal implants and lymphatic involvement may be determined. If resectability appears to be possible, the preliminary incision is extended upward to and through the costal arch, whence it is extended laterally between the eighth and ninth ribs as far as the posteromedial border of the scapula. The diaphragm then is incised through the esophageal hiatus. From this point on, the procedure may be carried out as described above, with several advantages: (1) Direct visibility for the conduct of all steps of the procedure; (2) accessibility of the celiac axis for more easy ligation of the left gastric artery and removal of the involved lymph nodes; (3) greater ease of resectability of involved adjacent organs such as the spleen, tail of the pancreas, colon or liver; (4) in case total gastrectomy is necessary, visualization of the jejunal blood supply is more satisfactory.

After closing the incision in the diaphragm and approximating the divided costal cartilage with absorbable or non-absorbable suture material, closure of the abdominal and thoracic incisions is carried out in the usual manner.

POSTOPERATIVE CARE

Of importance equal to the careful execution of surgical technique is efficient postoperative care. To the surgeon who is accustomed to operating within the abdomen, the thoracic approach presents peculiar postoperative problems.

The anesthetist has certain responsibilities in the early postoperative period. He should aspirate the tracheobronchial tree before the patient leaves the operating room. He must assure himself that the patient's color is good and the blood pressure is satisfactory. Preferably this is accomplished by proper maintenance throughout the operation. Otherwise the intravenous administration of fluid or blood after the patient has been returned to his room may be required. Intranasal oxygen may be necessary for 24 hours or more to maintain normal color. Carbogen administered by mask is helpful in securing the patient's cooperation with deep breathing. The patient should be turned from side to side at half-hourly intervals and six to eight deep inspirations should be taken at intervals of one hour. In order to encourage deep inspiration and coughing, analgesic drugs should be given sparingly. A high degree of judgment must be exercised in the administration of postoperative analgesics so that coughing is not inhibited by pain. At present the author uses meperidine hydrochloride, 50 to 100 mg. ad-

ministered at four- to six-hour intervals, the amount depending on the age, weight and tolerance of the patient. Experienced special nursing is a distinct asset in the conduct of postoperative care in these cases.

Intrathoracic negative pressure by means of a large intrathoracic Foley inflatable catheter is maintained until drainage through it ceases after two or three days. If this is done, postoperative aspiration of pleural effusion by needle seldom becomes necessary. Auscultation of the chest should be carried out at six-hour intervals during the first few days. Persistence of diminished breath sounds usually is indicative of pulmonary atelectasis well in advance of the usual appearance of increased pulse rate and temperature. In case of atelectasis, or if there is doubt, tracheobronchial aspiration is carried out and repeated if necessary until aeration is adequate in all portions of the thorax.

Nutrition is maintained parenterally for three or four days while Levin suction is in use, and sips of water are permitted. After removal of the tube, liquid, soft and finally solid foods are permitted as tolerated by the patient. Early ambulation is practiced if the functional capacity of the heart allows. Under this program the patient usually walks about the room, is on a general diet and is allowed home by the eighth postoperative day. At this point the exceedingly important follow-up period begins and continues over a period of months. During this time the surgeon should anticipate the patient's problems and sympathetically attempt to minimize them. The maintenance of the morale of patients who have been operated upon for cancer is extremely important during the follow-up period.

RESECTABILITY AND MORTALITY

Two factors affect resectability more than anything else: (1) the time at which the patient consults the surgeon, and (2) the degree of extension of metastasis to adjacent lymph nodes. Resectability increases with the degree of experience of the operating surgeon. During the early period of development of these operations as well as in the early experience of individual surgeons, the operative mortality was high. Between 1871 and 1907, mortality was 100 per cent. Between 1933 and 1943, the mortality experienced by all surgeons active in the development of these procedures ranged from 23 to 75 per cent. Reports[2, 7, 9, 11] from a variety of sources in 1948 indicate a mortality of from zero to 57 per cent.

Outline reports of ten recent consecutive cases are given in Table 1. Included is a variety of benign and malignant lesions in order to represent the possibilities of this type of surgical approach and therapy. The patient who died had malignant disease.

CASE REPORT

A typical case is that of a Caucasian woman, aged 70 years, first observed October 23, 1948. The principal complaint was of gas-like pain, present since May, which appeared to encroach on the capacity of the stomach. There was inappetence, inability to eat more than a little at a time and recent pain in the lower sternal region, left subcostal margin and to the back. Loss of 20 pounds in body weight was reported.

At the time of examination the body weight was 113½ pounds. The pyloric portion of the stomach was palpable. Lymph nodes were not enlarged. A recent roentgenogram disclosed a defect of the mid-stomach extending to within 2 cm. of the cardia. There was no roentgenologic evidence of metastasis. Upon gastroscopic examination, pallor of the

TABLE 1.—*Series of Ten Cases in Which Operation Was Done for Relief of Lesions of the Esophagus or Gastric Cardia.*

Case No.	Age	Diagnosis	Operation	Results
1	54	Adenocarcinoma of corpus with extension to cardia.	Transthoracic cardioesophagectomy.	Died 11th day postoperative of bronchopneumonia.
2	42	Adenocarcinoma of corpus with extension to cardia.	Transthoracic cardioesophagectomy.	Living 24 months postoperative with evidence of generalized carcinomatosis.
3.	69	Large benign peptic ulcer of esophagus.	Transthoracic esophagocardiectomy.	Living and well 22 months postoperative.
4	47	Squamous carcinoma of esophagus with adenocarcinoma of cardia.	Transthoracic esophagocardiectomy.	Survived for eight months after operation.
5	58	Squamous carcinoma mid-esophagus.	Transthoracic esophagocardiectomy.	Working 26 months after operation.
6	51	Adenocarcinoma of corpus with extension to cardia.	Subtotal gastric resection with esophagogastrostomy.	Survived operation. Died two months postoperative of carcinomatosis.
7	57	Leiomyosarcoma of cardia.	Transthoracic local excision of leiomyosarcoma.	Working 18 months after operation.
8	70	Reticulum cell lymphosarcoma of corpus with extension to cardia.	Abdominothoracic total gastrectomy with esophagojejunostomy.	Living and well 20 months after operation.
9	56	Massive ulcerating reticulum cell lymphosarcoma of corpus and cardia.	Abdominothoracic subtotal gastric resection with partial hepatectomy and esophagogastrostomy.	Survived operation. Allowed home on the 14th day postoperative to remain under the care of family physician.
10	44	Intractable cardiospasm; chronic duodenal ulcer.	Transthoracic vagotomy, gastrojejunostomy, cardioplasty and repair of esophageal hiatal hernia.	Living and well two months after operation.

mucosa and the presence of a large mass protruding from the posterior and superior walls on a broad pedicle were noted. Certain areas were covered with a glary white exudate but ulceration was not observed. The gastroscopic impression was sarcoma of the stomach with lymphosarcoma a strong possibility.

Surgical exploration through a Garlock incision on November 16, 1948, confirmed the presence of the mass which appeared to be resectable. Biopsy of a lymph node was reported as indicating lymphosarcoma.

Total gastrectomy was performed, and in addition the spleen and the entire greater omentum were removed. Esophagojejunostomy with jejunojejunostomy was carried out and the openings in the diaphragm and chest and abdominal walls closed. Except for aerophagia, convalescence was uneventful. Since operation the patient has received 2,800 roentgens of radiation over the abdomen. The patient was still living 20 months after operation.

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Gastric Resection

Preoperative and Postoperative Care

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SUMMARY

Perhaps in no other field of surgery does attention to minute detail play so important a role in determining success as it does in gastric operations.

As surgery of the stomach develops toward even greater security and favorable results can be expected with greater confidence, the several aspects of preoperative and postoperative care hitherto regarded as secondary demand closer consideration.

ADEQUATE preparation of the patient who is to undergo a gastric operation requires the utmost attention to minute detail. Not infrequently the recognition and treatment of disturbed bodily physiologic processes occasioned by the gastric lesion are of greater significance than any other preoperative problem.

In many instances gastric disorders are accompanied by recognizable pathologic changes in other systems, notably the cardiovascular-renal system. For this reason, the close cooperation of the internist and the surgeon is of the greatest benefit in securing a successful surgical outcome for the patient. With improvement in technique and care making gastric operation possible in older age groups, the incidence of cardiac difficulties with which a surgeon is confronted has likewise increased. An evaluation of the patient's cardiac status should include an estimate of the ability of the heart to withstand the conditions of stress to be expected during an extensive surgical procedure.

As a general rule, all patients who have reached 50 years of age should have an electrocardiogram preoperatively, whether or not the previous history is suggestive of cardiac disease. The persistent changes caused by previous silent coronary artery occlusions may be observed on the routine tracing. A suggestion of cardiac damage alerts the surgeon for possible postoperative complications.

Cardiac arrhythmia in the postoperative period may be averted by the administration of quinidine for several days before operation. The use of digitalis in some form is, of course, mandatory for the treatment of patients in actual or impending cardiac decompensation. Such appropriate yet simple preoperative measures, designed both to discover and to treat disturbed cardiac function, provide definite contributions toward minimizing postoperative cardiac complications and in obtaining good end results.

The presence of diabetes, if properly controlled, does not add measurably to the risk of operation. Consequently operation is not denied patients whose insulin requirements may be excessively high. However, it is usually necessary to hospitalize them for a few days prior to operation. During this period, the urine may be freed of sugar and ketone bodies by the administration of fluids and insulin. Isotonic saline solution or physiologic 5 per cent glucose solution may be used intravenously. If the latter is used, the 50 gm. of glucose it contains are covered by 25 units of regular insulin (one unit of insulin for each 2 gm. of glucose). The diet in the immediate preoperative period may contain considerably more carbohydrate than is usual for the patient in order to insure a maximum storage of glycogen in the liver. It is perhaps wise to provide not more than 175 gm. of carbohydrate daily, however.

The selection of an anesthetic agent poses an important problem, for the diabetic patient tolerates none of them well. In general, ether anesthesia should be avoided whenever possible, since it produces hyperglycemia. However, when the diabetes is complicated by severe cardiac disease, ether may still be the agent of choice, especially in elderly patients. In recent years, the use of nitrous oxide combined with intravenously administered curare to obtain muscular relaxation has proved of great benefit in the care of such patients. Spinal or even local anesthesia may be applicable in some cases.

Since the time of action of insulin is shortened by both anesthesia and surgical trauma, insulin must be given at more frequent intervals in the immediate postoperative period. Initially the postoperative insulin requirements are best determined by frequent blood sugar determinations; later the qualitative sugar reaction of the urine may provide a reasonably accurate guide. Fluid requirements are met mainly with the administration of saline solution and glucose solution covered by insulin (one unit per 2 gm. of glucose). It must be remembered, however, that since part of the glucose administered parenterally is excreted in the urine, qualitative measurement of the sugar contained in the urine will not always be an accurate guide for the amount of insulin necessary. The problem is oftentimes a

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delicate one. for acidosis and hypoglycemia are at opposite poles of quite a narrow bridge of therapy. In the immediate postoperative period it is wiser to err in providing too little control than too much.

Patients who have hemorrhagic lesions of the stomach and duodenum usually require several whole blood transfusions in addition to the general measures necessary to prepare them for gastric operation. When the hemorrhage has been massive the low hemoglobin level must be raised before operation is undertaken. If, however, the bleeding is of such severity that it becomes impossible to raise the blood count to the desired level, operation is mandatory to control the source of the bleeding.

In many patients with chronic secondary anemia resulting from a gastric lesion, the hemoglobin level may not rise beyond 30 per cent even with repeated transfusions. This is especially true in patients with gastric carcinoma. It is interesting, however, that these patients withstand operation surprisingly well. Although there is some controversy, the authors believe that multiple transfusions are of greater benefit to these patients when administered preoperatively than when given in the convalescent period.

A most important consideration in the preoperative period is the recognition of the effects produced by organic obstruction at or near the gastric outlet. Persistent pyloric obstruction accompanied by vomiting may lead to profound renal disturbances which affect not only the function of the kidney but its histologic appearance as well. Not generally appreciated, however, is the fact that a renal lesion may oftentimes serve to initiate a peptic ulcer.

The renal insufficiency which results from chronic gastric retention is due to the alkalosis that follows extensive loss of blood chlorides from vomiting. The kidneys are able to maintain normal function when they are called upon to excrete urine with pH values ranging from 4.5 to 7.8, even though the pH of the blood remains fairly constant at about pH 7.35. Urine of low pH value is excreted without difficulty, but the kidneys do not tolerate for long excretion of urine with a high pH. Thus, a state of relative or even absolute renal insufficiency may develop if alkalosis is present for a considerable time.

Such a state is manifested by changes in the chemistry of the blood wherein the non-protein-nitrogen is elevated, the CO_2 combining power of the plasma is increased and the concentration of serum chlorides is decreased. The severity of the changes in the chemical values will usually parallel the degree and duration of the obstruction. Also, as is well known, tetany may develop if the alkalosis is not corrected.

It is important to remember that uremia may be decreased by simple parenteral fluid therapy which, by virtue of the large volume of water, washes the solids through the renal system. However, a decrease in the non-protein nitrogen value may not always indicate a corresponding return in actual kidney function. This has been proved by creatinine clearance tests which frequently reveal poor kidney function even though the blood non-protein nitrogen value may have decreased considerably with the administration of parenteral fluids. To attempt gastric operation in the presence of unrecognized renal insufficiency is to invite disaster. It must be remembered, however, that oftentimes poor renal function will not be significantly improved until the primary gastric lesion has been treated surgically. In these instances, the selection of an optimum time for operation based on an accurate appraisal of the patient's general status and an intelligent interpretation of the blood chemistry values is of utmost importance.

The loss of blood chlorides which results from the persistent vomiting of gastric fluid containing a high concentration of hydrochloric acid can be effectively combated by the parenteral administration of normal saline combined with glucose solution. The glycogen reserve of the liver is replenished by the use of glucose solution. Patients who are in actual or borderline cardiac decompensation can be given glucose solutions in a concentration as high as 50 per cent, although 20 to 25 per cent solutions are less liable to cause venous thrombosis. Saline solutions should be isotonic, since with greater concentrations venous thrombosis is liable to occur.

The role of potassium depletion in patients with high intestinal obstruction has recently been a popular subject in the surgical literature. There is no doubt that there is considerable potassium loss from vomiting, more so with duodenal than with gastric lesions. However, it is necessary to make certain of the need for potassium before potassium solutions are administered, for indiscriminate use of them is highly dangerous. It must be remembered that the normal level for serum potassium is 4 to 5 mEq. while the fatal level of serum potassium is only 12 mEq. Not only is the margin of safety slim but the value of potassium, especially in the treatment of the effects of vomiting from pyloric obstruction, is questionable. Should its use be indicated, frequent serum potassium determinations to control the amount administered are absolutely necessary.

For most patients, two to four days of intensive preparation for operation are sufficient, although if dehydration is especially pronounced and the pyloric obstruction is high grade, this period may be slightly prolonged. The stomach is decompressed by an indwelling gastric tube drained by a Wangensteen suction apparatus. Constant suction is rarely used. Instead, the suction is interrupted for two-hour periods three times during the day at regular meal times. The patient is allowed to have clear liquids orally and is encouraged to be ambulatory during these two-hour periods. Frequently the naso-gastric tube is removed at bedtime to insure uninterrupted rest and to prevent the development of pulmonary complications.

The gastric enlargement will not be affected to any great extent by the preoperative program of suction. Since the increased size of the stomach

results from chronic work hypertrophy of the gastric musculature, an appreciable change in size could not be expected during the few days of preparation. The amount of edema in the gastric wall seems to be decreased, although frequently this is not pronounced.

The stomach is lavaged extensively with large amounts of tap water the night before and the morning of the operation. There is probably no additional benefit to be derived from the use of dilute solutions of hydrochloric acid. The mechanical cleansing of the gastric lumen to remove all particulate matter is probably the most important factor in the local preparation of the stomach. The production of acid is frequently stimulated by the lavage and aids in the bacterial sterilization of the stomach.

POSTOPERATIVE CARE

Although the principles governing the immediate postoperative care of surgical patients in general are applicable, certain therapeutic measures apply especially to patients who have undergone gastric operation. Continuous gastric suction is maintained for 48 hours after operation so that the duodenal and gastric secretions will not accumulate and distend the gastric remnant. Undue pressure upon the lines of suture may cause slight leaks which lead to intramural or extragastric abscesses. On the morning of the third day, the suction apparatus is clamped off, while the gastric tube is allowed to remain in place. After four hours, the amount of retained secretion in the stomach is determined. If this is found to measure no more than 120 cc., the tube is removed. Should there be larger amounts, it is wise to maintain suction for another day or two. In elderly patients in whom the likelihood of pulmonary complications is considerably increased by the presence of the indwelling gastric tube, removal of it at an earlier time, perhaps in as little as 12 to 24 hours following operation, may be considered.

The use of adequate but not excessive amounts of parenteral fluids is essential. The best guide to fluid therapy will be the determination of the amounts lost by gastric suction and in the urine. Usually three liters of fluid, one of which is saline, will fulfill the daily requirements. It must be remembered that oftentimes the amount of fluid lost through gastric suction is relatively small, indicating that the patient is retaining much of the duodenal and pancreatic secretions through a functioning gastroenterostomy. Under these conditions, one must be careful lest the circulation be impaired by excessive fluid administration. Adequate vitamin intake must be assured from the start. This is best accomplished by the addition of sufficient amounts of vitamins B and C directly to one of the daily intravenous infusions.

Water in 30 cc. amounts is given every hour after the gastric tube has been removed. This is progressively increased to 60 cc. per hour during the morning and to 90 cc. during the afternoon of the fourth day. Clear liquids are offered on the fifth day, followed by a progressive gastroenterostomy diet on the sixth day. By the time of discharge from the hospital, the patient receives a soft diet served in three to five feedings per day depending upon his ability to take the larger or smaller feeding. The patient is encouraged to continue with a soft diet for at least one month, after which he is permitted to add to his diet cautiously until almost a regular diet is being consumed. It is wise to permit the adoption of a liberal diet initially when the reparative processes are at their height rather than to delay for several months the institution of an almost regular diet. It is surprising how many patients do very well with no dietary restrictions. Patients who have undergone partial gastrectomy for nonmalignant disease should not be permitted to use tobacco in any form.

Perhaps the most important single factor in success or failure in the care of patients who have undergone gastric operation is the prevention of pulmonary complications. In the authors' opinion, early and effective ambulation provides the best safeguard against the development of acute pulmonary disease. On the day following operation, the patient is got out of bed at least twice, preferably three times. He is not allowed to sit in a chair but is forced to walk a few steps. A scultetus binder applied to the abdomen will provide a sense of security by virtue of its snug fitting nature. While up and about, the patient is encouraged to breathe deeply and to cough, since this is more effective while he is in the upright position. Should the patient be unable to raise thick sputum, or if the cough is ineffective due to pain, intratracheal suction is a valuable procedure which can be performed on the ward without difficulty. Oftentimes, even if the catheter cannot be inserted into the trachea, the slight irritation produced in the nasopharynx may produce an effective cough.

As a precaution against vascular complications, the nursing staff is not permitted to place pillows beneath the patient's knees in the popliteal spaces. The discomfort of the straight leg position is advantageous, since the patient, continually striving to find a comfortable position, will be forced to move his legs considerably. Also, even the mild compression of the popliteal veins is avoided.

Dicumarol and Quinidine in the Ambulatory Treatment of Chronic Auricular Fibrillation

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SUMMARY

Thirty-three patients with chronic auricular fibrillation were treated with digitalis and quinidine and in addition were given Dicumarol® to reduce the risk of embolism. In 21 of the patients the fibrillation was caused by rheumatic heart disease, and in 12 by arteriosclerosis or hypertension. Normal sinus rhythm was restored in 55 per cent of the 33 patients, in 67 per cent of those with arteriosclerosis or hypertension, and in 45 per cent of those with rheumatic heart disease. Embolism did not occur.

IT is well established that the efficiency of a heart with chronic auricular fibrillation is decreased by from 15 to 79 per cent.[7, 10, 20] Reversion to normal rhythm increases cardiac efficiency. The chief objection heretofore to restoration to normal rhythm has been based upon the danger of the formation of emboli. If this danger could be minimized, it is doubtful that anyone could object to an attempt to increase cardiac efficiency by conversion of auricular fibrillation to normal sinus rhythm.

It was the purpose of the study here reported to:

1. Inhibit the formation of thrombi and thereby eliminate the possibility of embolism.

2. Determine the clinical cardiac efficiency of a slowly fibrillating heart after digitalization.

3. Attempt to establish normal sinus rhythm by the use of quinidine.

4. Redetermine the clinical cardiac efficiency after restoration to normal sinus rhythm.

MATERIAL

Thirty-three patients with chronic auricular fibrillation, from the cardiac clinic of the Los Angeles County General Hospital, were studied. There were 29 males, four females. The ages varied from 17 to 83 years. Twenty-one of the patients had rheumatic heart disease, and 12 had arteriosclerotic or hypertensive heart disease. Duration of fibrillation in most cases exceeded two years prior to the study.

METHOD OF STUDY

1. All patients were initially digitalized and were maintained on digitalis during the entire study. After digitalization, clinical cardiac efficiency was estimated on the basis of circulation time, vital capacity and venous pressure.

2. A prothrombin time study was done initially. If the prothrombin time was normal, a daily dose of 100 mg. of Dicumarol® was given for the first three days. On the fourth day the prothrombin time study was repeated. If the therapeutic zone had not been reached, then 100 mg. of Dicumarol was administered daily for the next two days and the prothrombin time then was rechecked. Once a therapeutic level was reached it was found that 100 mg. of Dicumarol given every second day would usually maintain that level from week to week.

The desired therapeutic effect of Dicumarol was to maintain the prothrombin time in a range of from 20 to 40 per cent of normal.

Prothrombin time was determined according to Quick's[17, 18] modification, using a constant temperature block and rabbit brain for the thromboplastic substance (normal prothrombin time 12 to 13 seconds). The thromboplastic substance was made up in small amounts to maintain its freshness.

Prothrombin time was determined daily for short periods to evaluate the relative resistance or susceptibility to the drug and in most cases was checked later at weekly intervals.

3. For purpose of emphasis, the frequently published method of one of the authors[22, 23] for the administration of quinidine is herein repeated.

Method of Giving Quinidine

Day No.	8 a.m. Gm.	10 a.m. Gm.	12 noon Gm.	2 p.m. Gm.
1	0.1	....	....	....
2	0.1	0.1	....	....
3	0.1	0.1	0.1	....
4	0.1	0.1	0.1	0.1
5	0.2	0.2	0.2	....
6	0.2	0.2	0.2	0.2
7	0.33	0.33	0.33	....
8	0.33	0.33	0.33	0.33
9	0.33	0.67	0.67	....
10	0.67	0.67	0.67	....

If the patient complained of any toxic symptoms, such as diarrhea, gastric distress, nausea, etc., the dose was reduced to that of the previous day, for a few days; then the indicated schedule was resumed.

The importance of minimal doses of quinidine during the first few days is stressed to detect possible idiosyncrasy. It should also be stressed that the patients were ambulant; no emergency treatment was necessary, and there was ample time for quinidinization. Previous studies have indicated that if the maximum amounts of quinidine in a 24-hour

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period exceeded 2 gm., the establishment or restoration to normal sinus rhythm could not be adequately maintained on average daily doses.

4. After reversion to normal sinus rhythm resulted, the clinical studies of circulation time, vital capacity and venous pressure were repeated.

Venous pressure was determined by the direct method of Cohen,[5] vital capacity by means of the McKesson apparatus, and circulation times with ether for arm-to-lung and with calcium gluconate for arm-to-tongue.

5. Maintenance doses of Dicumarol, digitalis, and quinidine were continued for periods up to 20 months.

RESULTS

Of 33 patients treated, 18 (55 per cent) were restored to normal sinus rhythm; 15 were not. Of the successfully treated patients ten were in the group with rheumatic heart disease and eight in the group with arteriosclerotic or hypertensive disease. Thus the treatment was successful in 45 per cent of the rheumatic group and in 67 per cent of the arteriosclerotic and hypertensive group. This corroborates a previous report[24] of higher incidence of good response in arteriosclerotic and hypertensive patients than in those with rheumatic heart disease.

Tables 1, 2, and 3 summarize the details in the 33 cases. No embolic phenomena were encountered. One patient in the rheumatic group died suddenly. Postmortem examination revealed acute myocardial infarction due to coronary thrombosis.

The changes in the clinical cardiac efficiency in those cases in which normal rhythm was restored are summarized in Table 4.

The average change was an improvement of 22 per cent. This corroborates reports by others[7, 10, 20]

TABLE 1.—*Rheumatic Heart Disease Restored*

Case No.	Age	Sex	Duration Fibril.	B.P.	Before Treatment: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	After Restoration: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	Remarks
1.	46	F	2 wks.	140/100	2.0	82	7	16	2.4	80	5	13	Restored 2nd day.
2.	38	F	3 yrs.	130/90	2.0	168	10	24	2.6	96	7	18	Full 'Q' routine necessary.
3.	39	M	6 yrs.	124/84	2.0	124	15	30	3.4	142	12	22	Restored on 8th day 'Q.'
4.	33	M	2 yrs. (plus)	155/84	2.4	170	10	35	3.0	102	8	22	Full routine 'Q.'
5.	38	M	7 yrs.	138/86	3.0	160	12	31	3.6	96	8	20	Full 'Q' routine.
6.	66	M	3 yrs.	90/60	1.2	410	11	55	1.2	290	10	40	Amount of 'Q' required unknown.
7.	58	M	3 yrs.	115/90	2.0	74	10	21	2.8	76	7	18	Died at home due to ASHD* with coronary thrombosis. No 'Q' one week prior to death.
8.	61	M	25 yrs.	126/88	1.6	190	14	35	1.6	100	9	22	Known cardiac 45 yrs.; Amount unknown.
9.	49	M	3 mos.	90/78	4.2	136	11	24	4.4	92	7	18	Full dose 'Q' required.
10.	47	M	2 yrs.	150/94	2.6	112	6	14	3.4	102	6	13	Full dose 'Q' required.

*Arteriosclerotic heart disease.

TABLE 2.—*Rheumatic Heart Disease Unrestored*

Case No.	Age	Sex	Duration Fibril.	B.P.	Before Treatment: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	After Treatment: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	Remarks
1.	62	M	2 yrs.	170/84	3.7	124	20	50	4.3	102	15	30	Periods of "flutter" on 'Q.' Dicumarol toxicity—hematuria.
2.	17	M	2 yrs.	120/80	1.6	90	15	32	1.8	86	12	26	Frequent episodes of cong. heart failure and periods of flutter with 'Q.'
3.	48	M	4 yrs.	126/40	2.5	164	10	22	2.2	120	8	18	G.I. upset for 1 wk., followed by hematuria due to Dicumarol.
4.	32	M	1 yr.	180/80	2.6	100	15	45	2.4	92	12	27	Right hemothorax—900 cc. —due to Dicumarol.
5.	68	M	14 mos.	105/80	1.2	140	7	34	1.4	132	6	30	Felt better, less dyspnea—but remained cyanotic.
6.	68	M	1 yr.	146/54	3.6	124	11	35	3.8	112	10	32	Frequent episodes of cong. heart failure.
7.	46	M	6 mos.	100/70	2.2	116	11	20	2.8	104	9	22	Four episodes of cong. heart failure.
8.	29	M	2½ yrs.	120/78	2.7	106	20	32	3.1	102	14	26	Frequent attempts with 'Q' without results.
9.	24	F	1¼ yrs.	100/60	1.5	164	12	34	1.5	166	12	34	Cardiac enlargement grade four.
10.	47	F	2 yrs.	140/80	2.1	156	8	21	2.1	176	8	15	No improvement.
11.	39	M	8 yrs.	135/90	3.0	148	5	19	3.6	102	6	15	Cardiac symptoms since 1931. No cong. heart failure.

that cardiac efficiency is significantly increased by the restoration of a fibrillating heart to normal rhythm.

As long as Dicumarol was administered to maintain a therapeutic zone between 20 and 40 per cent of normal, embolism did not occur in this series.

Most of the patients have been under observation for over one year.

COMMENT

Clinical studies have shown that the cardiac output is increased, on the average, 30 per cent by conversion of slow fibrillation to normal sinus rhythm.[7, 10, 20] Experimentally in animals, Eyster and Swarthout[7] found cardiac output to be decreased by an average of 40 per cent with the onset of auricular fibrillation; Lewis[14] demonstrated a 20 per cent decrease. Thus, a fibrillating heart is in a state of decompensation. Abolition of auricular fibrillation brought about subjective improvement in patients studied.[22, 23, 25]

As long as auricular fibrillation persists there is the risk of the formation of thrombi and subsequent emboli. There has been considerable controversy in the literature* as to whether the restoration of normal rhythm increases the risk. Obviously, the optimum situation would prevail if, regardless of rhythm, the hazard of embolic phenomena were minimal. In recent years the use of 3,3'Methylenebis (4 - hydroxycoumarin), Dicumarol, has been accepted as an effective means of preventing the formation of fresh thrombi if the prothrombin in the blood is maintained at a given level of deficiency.[2, 3, 4, 6] The plan of "Dicumarolization" before and during therapy with quinidine in an attempt to convert chronic auricular fibrillation to normal sinus rhythm is, therefore, logical. The present study has offered such a plan.

It is proposed, on the basis of this series of cases, that the restoration to normal rhythm increases cardiac efficiency (as evidenced by improvement in circulation time, vital capacity and venous pressure); that the maintenance of therapeutically low levels of

*References: 9, 11, 12, 13, 16, 17, 19, 21, 26, 27.

TABLE 3.—*Arteriosclerotic and Hypertensive*

Case No.	Etiol.	Age	Sex	Duration Fibril.	B.P.	Before Treatment: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	After Treatment: Vit. Cap.	Ven. Pres.	Circ. Time: Ether	Gluc.	Remarks
(A) RESTORED														
1.	ASHD	67	M	3 mos.	110/76	4.0	100	6	14	3.8	76	6	12	Restored after second day 'Q' therapy.
2.	ASHD	75	M	5 mos.	110/74	4.6	108	9	17	4.2	76	5	18	Restored sixth day.
3.	AS-HHD	75	M	2 mos.	200/102	2.1	150	5	22	2.7	46	7	27	Restored fifth day.
4.	ASHD	60	M	1 yr.	140/92	1.4	210	14	32	1.8	144	11	21	Normal on eighth day 'Q.'
5.	AS-HHD	71	M	6 yrs.	185/110	1.3	130	11	40	2.2	44	8	28	Restored on full dose 'Q.'
6.	ASHD	83	M	11 yrs.	120/60	3.4	96	16	37	3.2	92	18	27	Normal on third attempt on fifth day 'Q.'
7.	ASHD	48	M	10 mos.	120/80	3.2	108	7	17	3.6	100	6	15	Normal on seventh day.
8.	HHD	75	M	5 mos.	200/100	3.6	126	6	18	3.8	92	6	16	Restored on fifth day.
(B) UNRESTORED														
1.	AS-HHD	74	M	5 yrs.	140/92	3.8	220	13	25	3.6	180	13	27	Complete heart block. Pulse dropped to 36.
2.	HHD	71	M	6 mos.	184/106	2.4	126	7	33	2.8	106	6	26	Left vent. strain. Marked improvement.
3.	HHD	56	M	3 mos.	200/110	1.4	300	22	37	1.4	300	22	35	Slow pulse (48); No change.
4.	ASHD	82	M	1 yr.	160/78	2.0	74	11	22	2.4	78	8	18	Symptomatic improvement; Pulse 72.

ASHD—Arteriosclerotic Heart Disease
HHD—Hypertensive Heart Disease
AS-HHD—Arteriosclerotic and Hypertensive Heart Disease.

TABLE 4.—*Changes in Clinical Cardiac Efficiency After Restoration of Normal Rhythm.*

	Rheumatic: Average Change	Rheumatic: Per cent Change	Hypertensive and Arteriosclerotic: Average Change	Hypertensive and Arteriosclerotic: Per cent Change
Vital Capacity	540 cc. Increase	23% Increase	213 cc. Increase	7% Increase
Venous Pressure	45 mm. of saline, Decrease	28% Decrease	45 mm. of saline, Decrease	35% Decrease
Circulation Time:				
Calcium Gluconate	2.7 sec. Decrease	25% Decrease	.9 sec. Decrease	10% Decrease
Ether	7.9 sec. Decrease	29% Decrease	4 sec. Decrease	16% Decrease

prothrombin in the blood has minimized the risk of embolic phenomena during and after conversion to normal rhythm.

Recently Foley and Wright[8] proposed long term anticoagulant therapy for chronic auricular fibrillation, thus decreasing the hazard of embolic accidents without attempting to change the cardiac rhythm. Such a plan has apparent advantages; and the authors of this presentation would add to it the attempted conversion to normal sinus rhythm, thereby decreasing by a large percentage the number of patients who would need to be maintained on anticoagulant therapy for an indefinite period of time.

The authors have found, as did Foley and Wright[8] and Olwin[15] that once a therapeutic deficiency of prothrombin in the blood has been reached and stabilized, maintenance may usually be effected without determinations of the prothrombin time any more often than seven to 14 days.

CONCLUSIONS

1. Every attempt should be made to convert chronic auricular fibrillation to normal rhythm. The authors prefer the combined use of digitalis and quinidine.

2. The present and previous studies indicate that the clinical cardiac efficiency of a fibrillating heart with a slow ventricular rate is definitely increased after restoration to normal rhythm.

3. Dicumarolization apparently reduces to a minimum the danger of embolic phenomena during and after conversion of auricular fibrillation to normal rhythm.

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The Administration of Anticoagulants

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SUMMARY

Heparin is administered parenterally. Its therapeutic effect is measured by the clotting time of the whole blood, determined by the method of Lee and White. An excessive anticoagulant effect is controlled by the administration of specific antagonists, toluidine blue or protamine sulfate. Dicumarol is administered orally in amounts sufficient to reduce the prothrombin activity of the plasma to between 10 and 30 per cent of normal. The prothrombin time, which represents such a reduction in prothrombin activity, will vary according to the method by which the determination is performed, the thromboplastin used, and the technique followed. Excessive prolongation of the prothrombin time is antagonized by the administration of vitamin K in large doses. Long-term therapy with Dicumarol is sufficiently hazardous to require considerable experience on the part of the physician. Where an immediate anticoagulant effect is necessary, yet prolonged administration anticipated, combined therapy with both heparin and Dicumarol may be used until the prothrombin time is prolonged satisfactorily, whereupon heparin may be discontinued.*

DESPITE the accumulation of a large body of literature on the use of the anticoagulants and the repeated publication of the details of the administration of these drugs, questions are still raised and cases reported which indicate an incomplete understanding by many physicians of the fundamental principles governing the administration of these drugs. For these reasons it is felt desirable to reiterate in as simple and concise a manner as possible the basic facts concerned in the use of heparin and Dicumarol, presented according to the outline in Table 1.

HEPARIN

Heparin is not effective orally, but it is effective by all routes of parenteral administration. Its action is manifested by the prolongation of the coagulation time of the whole blood and its effect is measured with sufficient accuracy for clinical purposes by the determination of the clotting time of whole blood in a test tube by the method of Lee and White.[9]

The advantages of heparin as an anticoagulant are several. It may be administered by the various parenteral routes: Intravenously (by intermittent injection or by continuous drip); subcutaneously (in aqueous solution or in Pitkin menstruum); or intramuscularly (in concentrated or dilute aqueous solution or suspended in oil or in a gelatin-dextrose medium). Its effect in prolonging the coagulation time of the whole blood is prompt unless it is suspended in a menstruum which delays absorption. Its effect wears off rapidly when the drug is withheld unless it has been administered in a menstruum which releases it slowly. Finally, the effect of heparin on the coagulation time can be determined conveniently at the bedside.

Heparin has two disadvantages clinically. It is expensive and it cannot be administered by mouth.

Intravenous Administration. Heparin is most commonly administered intravenously by the intermittent injection of the sodium salt dissolved in saline diluent in a concentration of 10 mg. per cc.[1, 7, 21] Injections are made at intervals of from three to six hours, most commonly at four-hour intervals. If the preliminary clotting time of the whole blood is normal, 50 mg. of sodium heparin in 5 cc. of saline is injected intravenously and the clotting time is determined at intervals of approximately one hour for the first four hours. The clotting time is usually prolonged from 30 to 60 minutes at the peak of the drug's effectiveness, and it does not return to normal until three to four hours have elapsed. Depending upon the response of the patient to this initial dose, 50 to 75 mg. of heparin is administered intravenously every four hours and the clotting time is determined immediately preceding each subsequent injection. The clotting time should be determined several times during each day of administration until the response of the particular patient is clearly determined.

TABLE 1.—*Administration of the Anticoagulants*

I. *Heparin*
- a. Intravenous, intermittent, or continuous.
- b. Heparin/Pitkin menstruum.
- c. Depo-Heparin.
- d. Aqueous Heparin, dilute, or concentrated.

II. *Dicumarol*
- a. Short-term.
- b. Long-term.

III. *Combined anticoagulant therapy*

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*"Dicumarol" is the registered collective trademark of the Wisconsin Alumni Association which controls the use thereof.

Heparin in saline may also be administered intravenously by continuous drip to bedridden patients.[1, 8] The object is to prolong the clotting time of the blood to from two to four times the normal time and to maintain this prolongation for the duration of therapy. This effect is generally achieved if 300 to 500 mg. of heparin added to a liter of 5 per cent glucose is administered at a rate of 15 to 25 drops per minute for the entire 24 hours. At this rate slightly more than 10 to 15 mg. of heparin is administered per hour and the total amount of saline introduced per 24 hours is about 1,200 cc. If this technique is employed, the clotting time should be determined every two to three hours, since longer intervals without testing are unsafe and have resulted in fatalities.

Heparin in Pitkin Menstruum. Loewe and his associates[10, 11] have advocated the use of heparin given subcutaneously in Pitkin menstruum, with or without the addition of vasoconstrictors (epinephrine and ephedrine). Loewe ordinarily administers an initial dose of 400 mg. of sodium heparin to patients weighing up to 200 pounds and follows it with 300 to 400 mg. given in single injections subcutaneously every other day. Administration is designed to maintain the clotting time between 30 and 60 minutes as determined by the Lee-White method. In the presence of a severe thromboembolic tendency 400 to 500 mg. of heparin in Pitkin menstruum is given and an attempt is made to prolong the clotting time to from one to two hours. Heparin in Pitkin menstruum is excessively painful and patients frequently refuse a second injection. As a further disadvantage, the response of the clotting time of the whole blood to this form of administration has been very irregular and unpredictable. Efforts are being made to produce a more satisfactory menstruum.

Depo-Heparin. Depo-Heparin Sodium® (Upjohn), a preparation of 200 mg. of heparin sodium, with or without vasoconstrictors, per cc. of a gelatin-dextrose medium, appears to be less painful than heparin in Pitkin menstruum, but it acts in a similar manner. There has not been sufficient experience with this product to assess fully its ultimate value. Depo-Heparin appears to be particularly useful as a means of administering heparin during the first few days of combined therapy, before Dicumarol has become fully effective. Two hundred milligrams given intramuscularly twice a day is satisfactory for the majority of patients. The clotting time, determined just before a dose is to be given, should not exceed 20 minutes. If it does, the dose should be postponed for six hours, or omitted.

Aqueous Heparin. Heparin may also be administered intramuscularly, dissolved in aqueous media for prompt absorption or suspended in oil menstruums for delayed absorption. It has been claimed that the administration of heparin in these media is less painful than when Pitkin menstruum is used. Intramuscular injection is to be preferred, not only because it is less painful, but because absorption is more rapid and more regular. While aqueous heparin has ordinarily been used in a concentration of 10 mg. per cc., Stats[20] and Neuhoff[13] have reported the successful use of a concentrated aqueous solution of heparin containing 100 mg. per cc. They administered the preparation in doses of 100 to 200 mg. initially, and either 100 mg. every eight hours or 120 to 140 mg. every 12 hours, depending on the coagulation time determined before each administration. The total daily dose should not exceed 450 mg. No confirmatory reports have come to the author's attention.

Control of Bleeding Due to Heparin. The first step in the control of bleeding due to or aggravated by heparin is to withdraw the drug. Transfusions, preferably of fresh, whole blood may be given to replace the blood lost and to stimulate blood coagulation.

There are two substances which appear to have a specific antagonism to the anticoagulant effect of heparin: The azo dye, toluidine blue,[2] and the protein from fish roe, protamine sulfate.[16, 17] Both promptly restore the coagulation time of the blood to normal; but the effect may be transient, and repeated injections, as indicated by the clotting time of the whole blood, may be necessary over a period of several days. Both drugs may be administered intravenously in doses of from 1 to 4 mg. per kg. of body weight, but a dose of 2 mg. per kg. of body weight, administered intravenously in 250 to 500 cc. of normal saline, appears to be adequate with either drug.

The toxicity of toluidine blue is relatively unknown. Although strongly hemolytic in dogs, it has not produced toxic effects when given in therapeutic doses to man. In man, the urine and stools become highly colored for 36 to 48 hours following the administration of therapeutic doses, but the skin does not become discolored when such doses are used. The experience with toluidine blue is extremely limited.

The protamines neutralize heparin in vitro and in vivo, although they themselves possess anticoagulant properties. Protamine sulfate is a foreign protein, and intravenous injection of it into a dog is followed by serious toxic effects. Apparently the reactions in the dog are anaphylactoid reactions peculiar to the canine species, since they do not occur in other experimental animals and have not occurred in man in the somewhat limited clinical experience so far reported.

DICUMAROL

It is believed that Dicumarol (3,3′ methylenebis-[4-hydroxycumarin]) produces an anticoagulant effect by suppressing the formation of prothrombin in the liver. Its effect is reflected in the prolongation of the prothrombin clotting time of plasma. When administered in ordinary therapeutic doses, it does not prolong the clotting time of the whole blood as determined in glass test tubes by the Lee-White

method. It must be remembered, however, that Dicumarol does produce a prolongation of the coagulation time of the whole blood under certain circumstances. The administration of Dicumarol in amounts sufficient to prolong the prothrombin clotting time of the plasma excessively is reflected in the prolongation of the coagulation time as determined in glass tubes. Also, the coagulation time of the blood is prolonged following the administration of small amounts of Dicumarol when the Lee-White test is performed in siliconel tubes.

Dicumarol has two advantages over heparin. It is cheap and it is effective when administered orally. There is no commercial preparation of Dicumarol for parenteral administration.

Dicumarol has certain disadvantages. When it is administered initially, there is a delay of from 48 to 72 hours in the development of its maximum effect as measured by the prolongation of the prothrombin time. Therefore, when the immediate hazard of embolization is great, heparin should be administered concurrently to protect the patient during this initial latent period. When Dicumarol is discontinued, its effect on the prothrombin time persists for from two to seven days. Therefore, when hemorrhagic complications occur during the administration of Dicumarol, it is necessary to invoke active measures to antagonize the effect of the drug promptly and efficiently.

The response of different individuals to given doses of Dicumarol is not predictable. Furthermore, the response of a single individual to given doses of Dicumarol may vary from day to day. It is necessary, therefore, to determine the prothrombin clotting time of the plasma on each day before Dicumarol is given.

The expense of performing a prothrombin test every day minimizes the economic advantage of Dicumarol, but, when a patient who has been receiving Dicumarol has been under observation for a time, it is frequently possible to lengthen the intervals between tests to as much as one week. However, extending the interval to more than 48 hours should not be attempted unless the physician has had extensive experience with the drug. It is evident that use of such a drug requires painstaking and meticulous observation of the patient and of the laboratory findings during the entire period of anticoagulant therapy.

The laboratory control of Dicumarol therapy must be understood clearly by any physician who wishes to use the drug as an anticoagulant. If the results of the prothrombin test are interpreted cautiously, they serve as an adequate guide to the administration of Dicumarol to the majority of patients. The one-stage method, first described by A. J. Quick and subsequently modified by other investigators, is used ordinarily for clinical purposes.*

The test is performed by adding to a sample of decalcified plasma an excess of ionic calcium and of thromboplastin and then determining the time necessary for the plasma to clot. It is based on the concept that if there is an excess of calcium and of thromboplastin in the coagulation system, the speed of clotting will vary in proportion to the concentration of prothrombin in the plasma. It is recognized that the actual facts are more complex than might be indicated by this simple explanation. The test is used because it provides the best available guide for clinical work, and because, without it, Dicumarol cannot be used either safely or effectively.

The following facts must be considered in the interpretation of the results obtained from the test by any given laboratory. First, there are several modifications in the technique of performing the prothrombin test. Second, there are several thromboplastic substances which can be used. Finally, the test is sufficiently sensitive to variations in technique, concentrations of reagents, and to environmental conditions that, using the same method and the same thromboplastin, significant variations in results may be obtained by different laboratories, or even in the same laboratory from day to day.

The clinician must understand the mechanism of the test and the potential causes for the variations which may be encountered in order to interpret the values reported to him. He must know what method is being used, what thromboplastin is being used, and what values are obtained when the prothrombin time is determined on plasma from normal subjects.

If the technique is varied or if thromboplastin from another source is used, values obtained on normal plasma will differ, sometimes significantly, from values obtained ordinarily. In such instances the standards of reference are no longer accurate for the results obtained on samples of plasma obtained from patients.

Thromboplastins prepared in different laboratories differ in potency, as do various lots of thromboplastin prepared in the same laboratory. Thromboplastin must be stored in a refrigerator at 0° C., but some degree of deterioration may occur despite this precaution. The material must be checked for potency at the time of use.

It is customary for each laboratory performing tests of the prothrombin clotting time to derive what is known as a "prothrombin activity curve." The prothrombin clotting times of undiluted samples of plasma (whole plasma) from normal persons and of similar samples of plasma diluted to 50, 25, 12.5, and 6.25 per cent of normal concentration are determined. The values, in seconds, are plotted against the per cent concentration of the diluted plasma. It is assumed that the reductions in prothrombin activity produced by diluting normal plasma with saline represent roughly the effect of orally administered Dicumarol in prolonging the prothrombin time of a patient's plasma.

* The one-stage method of determining the plasma prothrombin clotting time is described in detail by A. J. Quick; the two-stage method, by W. H. Seegers; and modifications of the one-stage method, by other authors, in the *Transactions First Conference on Blood Clotting and Allied Problems,* Josiah Macy, Jr., Foundation, New York, 1948.

Some workers report their results in per cent of prothrombin activity. Others report prothrombin times directly in seconds. It is the theory behind curves of this type that the temporal values obtained in one laboratory can be compared to those from any other laboratory by converting them into percentage of normal. It has not been demonstrated convincingly that conversion to per cent will permit exact comparison. However, the use of the percentage system permits a satisfactory comparison between the values obtained in various laboratories when there has not been a technical error in performing the test. An error in technique which affects the prothrombin time in seconds will be perpetuated, not corrected, by conversion of the temporal value into per cent of prothrombin activity.

Whether the results of the test are reported directly as the prothrombin time in seconds, or converted to per cent of prothrombin activity, the daily report from the laboratory should always include prothrombin readings in seconds for both the patient and the control. When the report is made in per cent alone, the clinician is completely dependent upon the figure reported and has no opportunity to evaluate the result in terms of the normal standard. It should be clear that, whereas the values in per cent for a given sample of blood in two or more laboratories should be similar, values in seconds will differ according to the method and thromboplastin used.

The routine for administering Dicumarol is as follows:[22]

1. The prothrombin clotting time of the patient's whole plasma is determined each day before the dose of Dicumarol is ordered for that day.

2. On the first day of therapy, if the preliminary prothrombin time is normal, 300 mg. of Dicumarol is administered orally in a single dose.

3. Thereafter, Dicumarol is administered according to the prothrombin time on the particular day, the response of the patient to previous doses, and the trend of the prothrombin curve, whether upward or downward. Ordinarily: (a) If the prothrombin activity is greater than 30 per cent of normal, 100 to 200 mg. of Dicumarol is given. (b) If the prothrombin activity is between 10 and 30 per cent of normal, 50 to 100 mg. of Dicumarol is given. (c) If the prothrombin activity is less than 10 per cent of normal, Dicumarol is withheld.

This scheme is modified frequently according to the trend in the prothrombin activity on the given day. Occasionally, patients will require doses of 200 mg. almost daily to reach and maintain a therapeutic level. Hyperreactors, especially those with liver damage, congestive heart failure, or renal insufficiency, may not require more than 50 mg. a day. It is better to give smaller doses every day than to give massive doses on two to three days out of the week.

The object of therapy is to keep the prothrombin activity between 10 and 30 per cent of normal. This is the equivalent of a prolongation of the prothrombin clotting time to between 30 and 50 seconds *as determined by the Link-Shapiro technique and using thromboplastin prepared from rabbit lung.*

Long-Term Anticoagulant Therapy with Dicumarol. It is not feasible to obtain a daily prothrombin time on patients who need anticoagulant therapy for an indefinite period.[6, 14, 15, 19, 22] Such patients include those with phlebitis migrans, recurrent thrombophlebitis, selected patients with coronary thrombosis and myocardial infarction, and those patients with rheumatic heart disease and auricular fibrillation who periodically release showers of emboli to the peripheral circulation.

Such patients are hospitalized for a few weeks, and Dicumarol therapy is carried out in the conventional manner. When the patient's response is determined, and if his daily requirement is fairly constant, he is sent home on a specified dose of Dicumarol and with instructions to report twice a week for a prothrombin test. If the prothrombin level shows only minor fluctuations, the time interval between prothrombin determinations is extended to a week. Since this method of management is somewhat hazardous, it is important that the patient cooperate intelligently by taking the exact amount of Dicumarol prescribed and appearing regularly for prothrombin determinations.

E. Sterling Nichol of Miami, Florida, has devised a simple, rapid formula for determining whether the patient's plasma prothrombin time represents a satisfactory diminution of the prothrombin activity. A daily control determination must be done on whole plasma obtained from a normal subject. A therapeutically satisfactory prolongation of the plasma prothrombin clotting time on any given day is between two and two and one-half times the control reading for that day, provided that the control value is no longer than 20 seconds. Thus, if the control value is 15 seconds, a satisfactory prolongation of the plasma prothrombin time is between 30 and 37 seconds. If the control value is 20 seconds, the patient's prothrombin time should be between 40 and 50 seconds.

Control of Bleeding Due to Dicumarol. To reduce an excessively prolonged prothrombin clotting time or to stanch bleeding during the administration of Dicumarol, three measures are indicated. The drug should be withheld until the prothrombin time is reduced to a safe level. Temporary shortening of the prothrombin time and decrease in bleeding may be effected by the transfusion of fresh whole blood (may be citrated), or of lyophilized plasma (reconstituted with 0.1 per cent citric acid and distilled water[3]). Finally, vitamin K preparations in doses of 60 to 75 mg. should be injected intravenously, and these injections should be repeated every four hours until the prothrombin time is satisfactorily reduced and remains so.[4, 18] In the occasional patient who does not respond favorably to ordinary vitamin K preparations, the use of vitamin K_1 oxide is sometimes effective.[5, 12] Massive doses of vitamin K and of vitamin K_1 oxide have been given on num-

erous occasions without ill-effect, the total dose in some instances having been within the range of 500 to 1,000 mg.

COMBINED THERAPY WITH HEPARIN AND DICUMAROL

If there is urgent need for immediate anticoagulant effect in a patient for whom Dicumarol therapy is desired, heparin may be administered concurrently with Dicumarol until the prothrombin time has been prolonged sufficiently to insure complete protection to the patient. Heparinization may influence the prothrombin clotting time if the blood used for determining the prothrombin time is taken during the first three hours following the injection of heparin. A specimen for determining the prothrombin time should be taken immediately preceding the injection of the maintenance dose of heparin, usually about four hours after the preceding dose. Ordinarily the coagulation time at this interval is not more than 10 to 15 minutes. When heparin is being given in a menstruum which delays absorption, blood for the prothrombin time should be obtained just before the daily dose of heparin is given. The clotting time of the blood will not be influenced by Dicumarol as long as the prothrombin time is not excessively prolonged and while the clotting time is determined in glass tubes by the method of Lee-White. Ordinarily there is no difficulty in managing the administration of either drug if these points are kept in mind.

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A Simple Electrosurgical Treatment of Rhinophyma

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RHINOPHYMA, the so-called "potato-nose," is a fibrous hyperplasia of the skin of the nose and adjacent cheek regions. It is practically unknown in women and is apparently becoming rarer in men. Contrary to popular belief, it is by no means always the result of alcoholic indulgence, although alcohol exacerbates rosacea, the common precursor of rhinophyma. Treatment is indicated if the condition causes ugly deformity or impairment of breathing.

PATHOLOGY

Rhinophyma is fibrous hyperplasia of the nasal skin resulting from chronic and recurrent inflammation of the sebaceous glands of the skin. Usually it follows long-continued and intractable rosacea in which recurrent congestion of the superficial capillaries and veins ultimately leads to a sort of vascular fatigue or paresis. Besides the general hyperplasia, there is pronounced dilation of the sebaceous follicles and telangiectases which combine to cause serious distortion of the whole organ.

TREATMENT

The classical treatment of this condition consists of simply shaving down the hypertrophied skin until normal contour is obtained. If the periosteum or perichondrium is not exposed, epithelial regeneration from the sebaceous glands is rapid. An objection to this method is that, owing to the extreme vascularity of the involved skin, there is so much bleeding during operation that accurate sculpturing of the nose is virtually impossible.

This objectionable feature of the operation has been overcome by substituting the electrosurgical knife for the cold knife. The operation is performed in one stage under pentothal anesthesia and the operating time required is 30 minutes or less. Any standard electrosurgical unit with both cutting and coagulating currents may be used. A variety of cutting "tips" should be available. The surgeon should be comfortably seated with easy access and a good view of the patient's entire face. The authors use Physoderm® with dexachlorophene for preoperative antisepsis of the patient's face. Using the cutting current of the electrosurgical unit, the nose is sculptured down to normal contour just as though the work were being done on an inanimate medium. The cutting current seals the smaller capillaries and as the larger vessels are encountered the bleeding is controlled by switching from a cutting to a coagulating current. The electrosurgical cutting tips must be kept free of coagulated tissue by scraping them with a knife. As the nose assumes a more normal contour, smaller points are used to curve the alar

Figure 1.—Typical case of rhinophyma before operation.

Figure 2.—Same patient as in Figure 1. Final results six months after operation.

and add artistry to the completed job. When the sculpturing has been completed, hemostasis is obtained by coagulation of vessels from which bleeding persists, but care must be used not to destroy tissue. The procedure described is also carried to the involved skin on the cheeks adjacent to the nose.

Postoperatively, the area is treated just as though it were a burn. A bland ointment and a gauze pressure dressing are applied. The external portion of the dressing is changed as it becomes moist. In the second week, areas of sloughing occur. This stage is best handled by alternating wet boric acid or saline compresses with ointment dressings. Healing begins as soon as the sloughed material separates and is generally complete by the fourth or fifth week.

The epithelial covering is at first pink and fragile. It must be protected from sun, wind and direct trauma until the epithelium becomes thickened. toughened and attains normal circulation.

Precautions:

1. Because this is an elective procedure, the patient should be in as good general health as possible. Most of the patients requiring the operation are elderly, and a thorough physical checkup is indicated.
2. The anesthetic must be non-explosive.
3. The excision of tissue must not be carried so deeply that the bone or cartilage is exposed, for then spontaneous epithelialization would not occur

and subsequent skin grafting would be necessary.

4. The excision must not be carried inside the nares lest cicatricial stenosis result. (If an error is made on the conservative side, further touch-up can always be done later.)

5. Infection should be watched for and treated if it occurs. (Infection has not occurred in any of the cases in the author's experience.)

CASE REPORT

A white male, aged 41 years, a salesman, consulted the authors because his prospective clients were so fascinated by his nose that he was failing in his work. There was no history of undue exposure to elements or excessive use of alcohol. General health was good. Rosacea of the nose had been present for four years with progressive development of rhinophyma in the past two years. Six months previously, a series of six x-ray treatments had been given with no appreciable change in the condition.

Physical examination revealed the typical rhinophyma shown in Figure 1. There were no other pathological findings.

Operation was performed as previously described in this presentation and the patient left the hospital the following day.

Sloughing of the area occurred but the sloughed material had completely separated by the eighth postoperative day and healing was rapid. The patient returned to work 26 days after operation and has remained entirely well for more than three years.

The final result, six months postoperatively, is shown in Figure 2.

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Adrenocortical Tumors

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SUMMARY

Hormonally active tumors of the adrenal cortex are either benign adenomas or adenocarcinomas. They may be located within the adrenal gland or as adrenal rests along the Wolffian tract. Hyperplastic cortical tissue without actual neoplastic formation is also capable of elaborating excessive cortical secretions.

At the present state of knowledge, any one or a combination of the following compounds may be elaborated in a given case: the electrolytic, glucogenic, androgenic, or estrogenic corticosteroids.

Whether or not Cushing's syndrome is primarily pituitary or adrenal in origin is still a matter of conjecture.

FOR all practical clinical purposes tumors of the adrenal cortex may be classified as benign adenomas or adenocarcinomas. Sarcomas are mentioned frequently in the older textbooks, but several pathologists have assured the author that, if they occur at all, they are extremely rare.[14, 17, 18] It is felt that earlier observers perhaps mistook hypernephromas, or so-called Grawitz's tumors of the kidney, for sarcomatous neoplasms and, because of the vacuolized cells in such tumors with a "striking resemblance" to those of the adrenal cortex, assumed that they arose from cortical tissue.[24] There is another type of cortical neoplasm which should be mentioned, namely, those originating in adrenal rests along the Wolffian tract. While rare, these extra-adrenal hypersecreting tumors produce much the same clinical picture as those in situ. Since a patient with such a finding has recently come under the author's observation, this aspect of the subject will be discussed briefly in this presentation.

As to size, cortical tumors may range from mere granules, in an otherwise normal-appearing stroma, to retroperitoneal tumors so large as to misplace the entire abdominal contents. Moore[22] stated that "the frequency of local hyperplasia and adenomas of the adrenal cortex is in indirect ratio to the exactness of the criteria and examination. Most adrenals contain some type of spherical mass—grossly demonstrated nodules are present in about 10 per cent of all adults." Goldzieher[8, 9] and Grollman[12, 13] independently have stated that adenomatous nodules ranging from the size of small nests of cells to tumors the size of a hen's egg are observed in approximately one-third of all autopsies regardless of age or sex. Commons and Callaway[5] in an attempt to correlate the incidence of hypertension and diabetes with adrenocortical pathologic changes, encountered 216 tumors larger than 3 mm. in diameter in 7,434 consecutive autopsies (2.86 per cent).

If all these data are correct, it may be inferred that approximately 30 per cent of all adrenocortical neoplasms are smaller than a pea. Most, if not all, of the larger tumors are adenocarcinomas. The size of the neoplasm is no index of its secretory ability. Growths no larger than a hazelnut have produced profound alterations in the body economy, while those weighing a pound or more, although secretory, may exert barely discernible bodily changes. In fact, very large neoplasms have been found to be secreting tumors only after extirpation and examination. Most of the cortical adenomas are globular or egg-shaped and well set off from the remaining adrenal tissue though without the help of a connective tissue capsule. They are sulfur yellow in color and often contain darker yellow or brownish pigmented areas. Microscopically the cells may be arranged as in the normal cortex with the glomerulosa in the periphery and the fasciculata toward the center or, for some unknown reason, this arrangement may be completely reversed. The cells are abundant in lipoids which microscopically appear as vacuolized areas under the influence of solvents. Adenocarcinomas are soft growths of yellowish color prone to necrosis and hemorrhage.[9, 22]

Both the benign adenomas and the adenocarcinomas may be further subdivided into secretory and non-secretory tumors. Since the non-secreting varieties produce no demonstrable endocrine changes, they will not be dealt with in this presentation, which concerns neoplasms, both benign and malignant, that pour into the circulation sufficiently abnormal quantities of hormone to alter the body economy in a number of well recognized ways. However, an encapsulated neoplasm, whether benign or malignant, is not essential to cortical hyperfunction. Simple hyperplasia can and frequently does produce excessive amounts of cortical secretion with readily recognizable clinical results. While the hyperplasia may be bilateral, it is not uncommon to find contralateral hypoplasia in both simple hypertrophy and neoplastic disease. The latter finding, unless previously recognized, is an extra hazard to operation. On rare occasions metastatic tumors of the adrenal glands have been known to destroy the glands bilaterally with resultant Addison's disease.[27] Adrenocortical insufficiency has also been reported in persons who primarily presented evidence of Cush-

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ing's syndrome and in patients with precocious puberty.[4, 8, 3]

Confusion still exists as to what constitutes the classical clinical picture as a result of overproduction of cortical secretion. This is understandable in view of the many and varied biochemical factors involved. Here it is perhaps not amiss to give a clinician's viewpoint of the over-all picture as it appears at present. For, to understand even the fundamentals of the highly individualized steroids elaborated by the adrenal cortex is to realize that there is no single clinical picture of cortical overactivity, but rather various combinations of signs and symptoms, some most bizarre and seemingly paradoxical, which by inference implicate not only selective types of oversecretion but certain cytological structures as well. It is not yet possible to predict the cellular structure of a given neoplasm from the clinical picture encountered. However, this may not be far distant, since there is some experimental evidence to show that the zona glomerulosa secretes desoxycorticosteroids, which regulate fluid and electrolytic balance, and the zona fasciculata secretes 11-oxycorticosteroids which are concerned with gluconeogenesis, resistance to stress and the physiological mechanism of antibody production.[11]

While 27 or more compounds have been isolated from the adrenal cortex in crystalline form, at present four or perhaps five form the basis for most, if not all, clinical studies.[29] All of these are known to have been elaborated in greater or lesser quantities and in various combinations by both benign and malignant tumors. They are:

The electrolytic corticoids — Desoxycorticosterone, affecting mainly the balance of sodium, potassium, chloride and indirectly water, the overproduction of which results in the retention of salt and water, the excessive excretion of potassium—edema, hypertension and congestive heart failure.

The glucogenic corticoids — 17-hydroxy-11-dehydrocorticosterone (Compound E or cortisone), 11-dehydrocorticosterone (Compound A), corticosterone (Compound B), and 17-hydroxycorticosterone (Compound F), the overproduction of which results in muscular weakness, osteoporosis, a failing glucose tolerance, edema, fat deposits in the face and abdomen, amenorrhea, purplish striae of the skin, lymphopenia and eosinopenia, and a negative nitrogen balance.

The androgenic corticoids—Androstenedione, 11-hydroxy-isoandrosterone, androsterone and 17-hydroxyprogesterone, the overproduction of which produces masculinization of the female, lowering of the voice, amenorrhea, hypertrophy of the clitoris, acne, hirsutism, and occasional baldness; sexual and somatic precocity in the male child and heterologous changes in the female child.

The estrogenic corticoids—Estrone and progesterone, the overproduction of which produces feminization of the male, impotence, gynecomastia; homologous sexual precocity in the female child.

It is quite likely that as the various chemical compounds and their effects upon the body economy are elucidated, this list will grow. It is also to be hoped that some day the effects may be organized into regular clinical syndromes easy of recognition both as to pattern and etiologic delineation. At present, however, attempts at specific clinical classification leave much to be desired. Even the nomenclature is confused. A case in point is the classification of Kenyon,[19] which is as good as any and much better than most. He recognizes (1) the adrenogenital syndrome, (2) Cushing's syndrome, (3) mixed types including features of the two previously mentioned types, (4) a type characterized by a single endocrine manifestation, and (5) a type producing feminization of the male or homologous sexual precocity of the female.

The so-called adrenogenital syndrome must be considered first in the light of severity or degree. Where does normal function end and abnormal function begin so far as cortical function is concerned? Constitutionality alone plays a large part in the production of body type, body and facial hair, and even aberrant carbohydrate utilization. Many women of Russian-Jewish ancestry, as well as those of Mediterranean origin resemble, in a modified but sometimes rather startling manner, women who have Cushing's disease. Is their tendency toward trunk obesity, thin extremities, cervical kyphosis, hairiness and frequent family history of diabetes the result of inherent functional adrenocortical hyperactivity, or is this picture merely the reflection of the genetic type? Not so long ago, as a consultant, the author observed a moderately overweight young woman with facial, thigh and some chest hirsutism, who was being demonstrated as a patient with adrenocortical disease necessitating surgical treatment. However, when the patient was asked about her sister and mother, she said, "Both of them have more body hair than I." Obviously they did not all have adrenocortical disease. Frequently, however, it appears that hirsutism is not present in the mothers of such hairy females and that the tendency is apparently handed down from the male side of the family. It should be borne in mind that constitutional factors rather than adrenocortical, ovarian and testicular disease enter into some problems of homologous precocious puberty.

Aside from the factor of constitutionality and that of degree, the frank adrenogenital syndrome manifests itself differently according to the age of onset. Pseudohermaphroditism is said to be the result of adrenocortical hyperfunction in prenatal life. Pseudohermaphroditism has been produced experimentally in the offspring of pregnant animals which have been subjected to the administration of large doses of hormone.[10, 15, 28] One can see no reason why excessive production of either androgenic or estrogenic compounds would not produce sexual reverses in human fetal life: however, genetic deformities uninfluenced by sex hormones are so common elsewhere in the body as to argue against such etiological emphasis. If the so-called adrenogenital syndrome manifests itself early in life, it will produce sexual and somatic precocity of the masculine

type in young boys and heterologous changes or masculinization of the female. In adult women, amenorrhea, hypertrophy of the clitoris, atrophy of the breasts, body and facial hirsutism with alopecia of the scalp occur in varying degrees and combinations, while in the adult male only excessive masculinization is apparent.

It is next to impossible to discuss adrenocortical neoplasms without touching upon the perennial controversy concerning the primary cause of Cushing's syndrome.[7] There are two schools of thought: (1) that which clings to the theory that the primary disease is to be found in the adenohypophysis, as Cushing himself intended it to be, and that the adrenocortical lesions so commonly encountered are secondary to demonstrable cytological changes in this small but important organ; and (2) that which holds that the adrenal cortex is primarily involved and that the small basophilic adenomas and hyalinization or Crooke changes[6] in the cytoplasm frequently demonstrated in the adenohypophysis are merely the results of excessive cortical secretion. Both schools comprise experienced and conscientious observers.[1, 20, 3, 16, 21]

The fact that small basophilic adenomas of the anterior pituitary were found to be present rather frequently in persons in whom there was no clinical evidence of Cushing's disease,[23] while a number of patients with practically every symptom described by Cushing were discovered to have adrenocortical tumors, or cortical hyperplasia with few if any demonstrable changes in the pituitary, turned the tide in favor of the adrenal theory. The most recent (at least in print) champion of Cushing's original theory is Sosman,[25] by virtue of the fact that two out of six patients who had received roentgen irradiation to the pituitary, under his direction, have remained well for six years and 16 years. One patient, after pronounced improvement, had a relapse and died five years later, while one is living and apparently responding to treatment. Although the author for several years has been leaning toward belief in the primary involvement of the adrenal cortex, it must be admitted that the recently demonstrated potency and far-reaching clinical effects of the adrenocorticotropic hormone have somewhat shaken that belief. If under certain circumstances the adenohypophysis can pour into the circulation large amounts of this compound (ACTH) over a considerable period, almost anything could happen, especially to its target organ, the adrenal cortex. An overstimulated, hyperactive adrenal cortex could easily do the rest.

Cushing's syndrome, as it was originally known, consisted of a group of well recognized symptoms as follows: There was rapidly developing obesity of the face and trunk with concomitant atrophy of the extremities, purplish striae of the abdomen and flanks, purpuric and acneform eruptions of the skin, polycythemia, hypertension and decalcification especially of the spine, with early kyphosis. In addition, every female with this disorder that the author has observed has had, in a greater or lesser degree, some symptoms of masculinization such as excess facial and body hair, and occasionally amenorrhea, enlargement of the clitoris, and breast atrophy. It would therefore be difficult to recognize a clear-cut picture of Cushing's syndrome devoid of any or all of the evidences of the adrenogenital syndrome. It is also interesting to note that the administration of adrenocorticotropic hormone over long periods to arthritic patients produced the same untoward symptoms as prolonged cortisone administration, namely, the classical features of adrenocortical overactivity indistinguishable from the symptoms produced by hypersecreting adrenocortical neoplasms. It should also be noted that female patients so treated developed a degree of hirsutism and acne.[26]

Every patient with a frank adrenogenital syndrome, or the so-called corticometabolic syndrome (Cushing's disease) demands careful study. While the diagnosis can usually be made without difficulty at the time the patient seeks medical aid, the primary cause is frequently obscure. The physician must ask himself if the offending disease lies in the pituitary, the adrenal cortex, the thymus, in adrenal rests along the Wolffian tract, or perhaps in the fourth ventricle of the brain. Much depends upon the physician's attitude and therapeutic approach. A general physical and pelvic examination is, of course, essential. Studies of the urinary corticoids, ideal in all such problems, are still limited to endowed medical schools and institutions. Roentgenograms of the sella avail nothing since basophilic adenomas, if present, are too small, except in very rare instances, to present roentgen evidence of the disorder. Roentgenograms of the chest are essential in all patients to rule out enlargement of the thymus or neoplastic disease in the mediastinum. Roentgenograms of the skull, pelvis, spine and long bones may or may not reveal demineralization. Retrograde or even intravenous pyelograms may reveal a misplaced kidney, or on occasion be sufficient to outline a large adrenal tumor. Perirenal air insufflations in the adrenal area are used diagnostically by some physicians, but the procedure is considered relatively uninformative and even dangerous by others.

The 24-hour excretion of urinary 17-ketosteroids is more or less an index of the androgenicity of the cortical neoplasm. Values are usually considerably increased in the presence of malignancy with the predominant clinical picture of the adrenogenital syndrome. Moderately high values are found in benign adenomas, adrenal rests and simple hyperplasia, while values may be normal or only slightly elevated in Cushing's disease where virilism is a minor factor. A new and simple color test for dehydroisoandrosterone, said to be of value in the diagnosis of adenocortical tumors, has recently been devised.[2] The author has not had opportunity to evaluate it.

Other laboratory values vary according to the type and concentration of the elaborated secretions. The serum cholesterol, while frequently elevated, may be normal. There is usually a poor glucose tolerance with frequently a frank diabetic curve and

glycosuria. The basal metabolic rate and protein-bound iodine are frequently elevated. There may, or may not, be retention of sodium and chloride with potassium excretion resulting in hypertension.

If the corticogenital or corticometabolic syndrome is present and the offending lesion is not apparent, primary exploration by the abdominal route should be carried out. This gives opportunity to palpate both adrenals and to aid in the retroperitoneal extirpation of the adrenocortical neoplasm or hyperplasia, if and when discovered. In the female it also affords opportunity to see and palpate the ovaries and adjacent structures for adrenocortical rests and other virilizing neoplasms.

In addition to routine measures, patients undergoing cortical extirpation should be prepared by the administration of liberal quantities of the cortical hormone the day before, during and immediately following the operation. Large quantities of hormone are occasionally necessary for several days postoperatively to keep the patient from rapid collapse and death. Successful extirpation of the neoplasm results in amelioration or complete elimination of the entire symptom complex over a period of time.

CASE REPORTS

A girl 13½ years of age was referred because of a recent growth of hair on the face and sides of the neck. Although the patient came from a "very hairy family," her mother felt that this type and distribution of hair was probably not normal. The patient began to mature at 11 years of age—the breasts filled out to a moderate degree, and pubic and axillary hair appeared. She had never menstruated. When she was about 12½ years of age her voice began to change and to break on occasion like that of any adolescent boy. The psyche was preadolescent but entirely feminine. The patient was otherwise well.

Well developed and with normal feminine configuration, the patient was 65.5 inches in height, and weighed 127.7 pounds. There was abundant head hair, slight hairiness of the face and neck, and a male pubic escutcheon. The abdomen and legs had been shaved. Upon pelvic examination the vaginal introitus was noted to be small, but a sound could be inserted for approximately 3 inches. The clitoris was large and hooded, the labia were small. A small nodule which was believed to be an undeveloped uterus was noted in a rectal examination.

The basal metabolic rates were –21, –26. The blood cell count was normal except for moderate eosinophilia. There were no abnormalities in the urine and the blood values for cholesterol, protein-bound iodine, glucose tolerance, and icteric index were all within normal limits. Intravenous urograms and x-ray films of the skull were negative. The 17-ketosteroid excretion was 26.6 mg. in 24 hours (normal values for females, 8 to 13 mg.).

At first the patient was considered as having a benign adrenogenital syndrome and 5 mg. daily of stilbestrol was administered. In spite of gradually increasing the dosage up to 20 mg. daily, hirsutism became rapidly more pronounced. No withdrawal bleeding was produced. While large doses of stilbestrol were being given, the 24-hour 17-ketosteroid excretion at first dropped to around 10 mg., but approximately eight months after the initial examination, the values had risen to 42.6 mg. The face hirsutism had become increasingly embarrassing and exploratory operation was decided upon.

At laparotomy, performed about ten months after the patient first came under observation, the uterus was noted to be very small and undeveloped. The ovaries were small and sclerotic and the left ovary contained a cyst at the upper pole approximately 2 cm. in diameter. The cystic mass was excised and wedge-shaped biopsies were taken from both ovaries. The mass contained a mushy, yellowish material, similar to but not exactly like the material found in corpus luteum cysts. On palpation both adrenal glands appeared to be moderately hypertrophic. The postoperative course was uneventful.

The pathological report was as follows:

A mass 8 mm. in diameter removed from the left gonad revealed two blue-brown areas of tissue with attached capsule, each of which measured up to 2 cm. in greatest dimension. On section these masses were observed to consist of a group of clear cells resembling luteal cells but more like adrenocortical tissue containing a dusting of dark brown pigment.

Special stains were made to detect the presence of a hormone according to the method of Camber.* Fresh adrenal cortex was used as control. Positive pink-red stain for the presence of adrenocortical hormone was found in abundance in the ovarian tumor cells.

The wedges taken from the sclerotic but otherwise normal-appearing gonad sites contained numerous ova within a single layer zone of granulosa cells. None of them were stimulated to the formation of follicles or germinal hillocks. The findings were identical with those in normal prepubertal ovarian cortex.

The final diagnosis was adrenal cortex rest of left ovary.

Follow-up: The patient began menstruating two months after operation. The breasts gradually became larger, the uterus began to enlarge, the hair on the face, chest and arms gradually became finer and thinner, and the skin became soft and smooth. At the last observation, seven months after operation, the patient stated that she had been menstruating regularly. The cycle took 28 to 34 days with a four- to five-day period of rather scanty menses. The vaginal epithelial cells were well cornified and occurred in small sheets. The general configuration, psyche, and hair distribution were becoming more and more mature and feminine although the voice remained low.

* * *

A white married woman 36 years of age complained of a rapid gain in weight, from 128 pounds to 199 pounds since the birth of her last child, three years previously. Other complaints were of weakness, especially of the lower extremities, irregular menstruation, and hemorrhagic spots over the body.

Very obese, the patient was 63 inches in height, and weighed 189 pounds. Most of the weight was limited to the trunk; the arms and legs were relatively thin. There was also the characteristic kyphosis of the cervical spine so commonly seen in Cushing's syndrome. There was slight hirsutism of the face, but the distribution of hair over the body was otherwise normal. The blood pressure was 170 mm. of mercury systolic and 90 mm. diastolic. The heart appeared to be moderately enlarged in all diameters but the sounds were forceful and of good quality with a regular rhythm. Dark-bluish striae covered the abdomen. The liver appeared to be enlarged, the lower edge extending from 5 to 6 cm. below the costal margin on the right. It was not tender, and no nodules could be felt. Neither kidney could be palpated. Roentgenograms of the skull revealed a small, bridged sella turcica. Basal metabolic rates were zero. The urine, blood cell count, hemoglobin content, sedimentation rate and glucose tolerance were essentially normal. Cholesterol values

* Camber, B.: Histochemical demonstration of ketosteroids in the adrenal cortex, Nature, 163:285-286, Feb. 19, 1949.

were 277 mg. per 100 cc. of blood. Twenty-four hour excretion of urinary 17-ketosteroid was 5 mg. on one occasion and when repeated before operation was 2.6 mg. Air insufflation of the perirenal area was considered, but because of abdominal obesity and the advantage of more complete abdominal exploration, laparotomy was performed about eight months after the initial examination. The uterus was normal in size, firm in consistency and of regular contour. The right ovary was adherent to the posterior surface of the broad ligament. The liver was moderately enlarged, the gallbladder and spleen normal, the kidneys small. On the right adrenal gland was a walnut-sized mass which seemed to be circumscribed and much firmer than the surrounding tissue. The left adrenal gland was normal in size and consistency. The abdominal incision was closed without drainage and the tumor removed through a right subcostal incision.

Following the operation the patient went into shock and, in addition to routine measures, a large amount of adrenal cortex substitution was necessary. In all, 420 cc. of aqueous cortical extract and 16 cc. of lipo-adrenal cortex extract were administered in five days during the postoperative crisis.*

The pathological report was as follows:

The right adrenal gland contained a bright orange cortical tumor measuring 3.5 x 2.5 x 1.8 cm. At the edge of the adenoma there was evidence of dissection, and other fragments of this cortical tumor were submitted separately. There appeared to be compression of the subjacent adrenal gland, and section through the adrenal gland tissue revealed a central portion that was gray in color. Upon examination of sections, the tumor was noted to be rather uniformly bright yellow-orange in color, with focal areas of gray-tan in the central portion. The second portion of the specimen consisted of gray-tan lymph nodal structure obtained from the para-aortic area. The third portion consisted of fatty tissue also obtained from the para-aortic area.

Microscopic examination of sections through the compressed normal adrenal gland tissue including division of the cortex and medulla revealed these structures to appear essentially unchanged except for the fact that some of the adrenocortical cells appeared to contain a little less than the normal amount of fat. Lymphoid and fatty tissue without evidence of malignancy was noted in examination of sections through the second and third portions of the specimen.

Diagnosis: Benign adrenocortical adenoma, right adrenal gland.

Follow-up: The patient began losing weight shortly after leaving the hospital and in all lost approximately 30 pounds. Menstruation began two months after the operation. Many of the abdominal striae faded and most of the facial hair disappeared. The blood pressure was 130 mm. of mercury systolic and 90 mm. diastolic. The patient tired easily and was extremely sensitive to cold.

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Amebic Abscess of the Liver

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SUMMARY

In a review of the records in 50 cases of amebic abscess of the liver observed in the Canal Zone between 1920 and 1945 the following features were noted:

Incidence was preponderantly in males and highest in persons between the ages of 20 and 40. None of the patients was under 21 years of age.

There was a great variety of complaints at the time of admission to hospital. The most common was pain in the right upper quadrant of the abdomen.

Demonstration of either elevated or fixed diaphragm by x-ray film and fluoroscopic examination was useful in diagnosis in a number of cases, but absence of such findings did not rule out abscess of the liver.

In some cases there was history of previous dysentery with blood in the stools.

One or another of three operative procedures was used for drainage of abscesses in 39 patients. Of the 39, six died; in five of the six, multiple abscesses were present.

Emetine hydrochloride was given to all patients.

THE following is a study and analysis of 50 cases of amebic abscess of the liver in patients that were admitted to Gorgas Hospital, Ancon, Canal Zone, between the years 1920 and 1945. There are added in this article two illustrative case histories of patients treated by the author in 1947 and 1948 in northern Peru, South America.

After 1919 there was a sharp drop in the incidence of this disease in the Canal Zone, which is attributable to improvement of general sanitation measures and also to the use of the better methods of treating the cases of amebic dysentery, which reduced the hazard of amebic abscess. In the days of construction of the Panama Canal, the Japanese truck gardeners used human excreta for fertilizer. This was eventually forbidden, which probably accounts for a part of the decrease in incidence after 1919. The use of emetine hydrochloride was instituted at Gorgas Hospital at about this time. This also caused reduction in incidence of amebic abscess of the liver.

In the list of 50 cases occurring between 1920 and 1945, amebic abscess of the liver was diagnosed clinically in eight patients. Diagnostic aspiration was done in all eight cases but abscess was not demonstrated in any of them. The eight patients were treated with emetine and all of them responded satisfactorily.

This study is based primarily on the cases that appeared between 1920 and 1945, not inclusive of the eight in which the clinical diagnosis was amebic abscess of the liver.

The incidence was highest in persons between the ages of 20 and 40. There were no cases in persons under 21 years of age.

Although the disease was observed in patients of various nationality and racial background, in each case it occurred in an individual who had spent several years in a locality where there was a high incidence of amebiasis.

The distribution by sex was rather striking, in that in only one of the 42 cases was the patient a woman.

On admission to the hospital the patients had a great variety of complaints. The most constant chief complaint was pain in the right upper quadrant of the abdomen. A list of the complaints and the number of patients complaining of each follows:

Pain in right upper quadrant of abdomen	18
Generalized abdominal pain	9
Pressure pain in right chest	4
Fever	4
Bloody dysentery	3
Pain in left shoulder and epigastrium	2
Pain in right side of back	1

Several patients had symptoms and clinical findings of a very obscure nature at the time of admission, and abscesses were not demonstrated in them, or did not develop, until four to six weeks later. For example, one patient had symptoms typical of acute appendicitis. Appendectomy was performed immediately and the appendix was found to be normal. Two weeks later symptoms of abscess of the liver developed. Exploratory aspiration was performed and the abscess was drained. This patient was discharged as cured after 95 days in the hospital. Another patient was admitted with a complaint of fever and chills. On admission he was found to have tertian malaria and was treated accordingly. A few days later symptoms of pathologic change in the right upper quadrant of the abdomen were noted. Upon fluoroscopic examination of the chest it was noted that there was no movement of the right diaphragm, but it was not elevated. Exploratory aspiration was performed, an amebic abscess was found and drained, and the patient recovered.

Other significant complaints and the number of cases in which they were noted were: Diarrhea, 6; nausea and vomiting, 9; fever, 17; malaise, 1; indigestion, 1; chills, 5; anorexia, 6; night sweats, 1; cough, 1; headache, 1.

Physical findings in the large majority of cases were such as to localize the pathologic changes in the region of the liver. The findings and the number of cases in which they were noted: Tenderness and

rigidity in right upper quadrant, 24; enlarged liver, 17; abdominal distention, 3; generalized abdominal tenderness and rigidity, 5; elevated diaphragm, right, 1. In four cases there were no abnormalities noted upon physical examination at the time of admission.

A very helpful physical sign was the reaction to single finger percussion over the liver area of the chest and abdomen when abscess was suspected. At the point of maximum tenderness a needle was introduced for aspiration to establish the diagnosis.

A very useful procedure, at times, as an aid in diagnosis of this disease was the use of the x-ray film and fluoroscopic examination of the chest. In 11 cases either elevated or fixed diaphragm was noted upon x-ray examination. Demonstration of either of these conditions is highly indicative of subdiaphragmatic disease. However, absence of these findings does not rule out liver abscess, because they occur only in the early stage of the disease and only if the abscess is situated in the upper portion of the right lobe of the liver. If the abscess is located either in the left lobe or in the lower portion of the right lobe, the usual clinical finding will be enlargement and tenderness of the liver; and if the condition is allowed to go untreated, the inflammation will manifest itself in the upper regions of the abdominal wall.

In 11 cases there was history of previous dysentery with blood in the stool; in 31 cases there was no such history. In that total of 42 cases, there were ten in which amebae were found in the stool, and 31 in which amebae were not found. Other laboratory findings were not significant. Leukocytes in the blood at the most acute stage of the disease numbered from 6,000 to 30,000. Results of examination of the urine were of no particular aid in the diagnosis. The icteric index was elevated in only about one-fourth of the cases; the highest was 26 units.

One or another of three surgical procedures was followed in the treatment of most of the patients: (1) laparohepatotomy—extraperitoneal drainage of the abscess of either right or left lobe (17 patients); (2) thoracohepatotomy—extrapleural drainage with rib resection at the appropriate site (15 patients); (3) transthoracic hepatotomy—two-stage thoracohepatotomy (transdiaphragmatic) when the abscess was high in the dome of the right diaphragm (seven patients). Three patients were not operated upon.

Operative procedure to drain the abscess was carried out in 39 of the 42 cases in which a diagnosis of amebic abscess of the liver was established by operation or by autopsy. Six of the 39 patients (15.2 per cent) died, and five of the six were found at autopsy to have multiple abscesses. In the sixth case autopsy was not done. There were, then, 34 patients with single abscess of the liver who were operated upon, and in this group there was one death (2.9 per cent). Two of the six patients who died had been operated upon a second time when evidence of the presence of another abscess developed. In one of these two cases there was no other abscess found at autopsy, but there was extensive destruction of the liver. In the other case, many small abscesses in both lobes of the liver were noted at autopsy. A course of emetine hydrochloride was given to all patients. The usual course consisted of 0.3 gm. given subcutaneously twice a day for ten days.

Thirty of the patients had a single abscess in the right lobe of the liver, six had multiple abscesses, and six had a single abscess in the left lobe.

Cases of multiple abscess were extremely difficult to manage. In most cases not all of the abscesses could be drained. In cases of multiple abscess, the lesions were of various sizes and distribution. One patient had numerous abscesses in both lobes. Another had multiple abscesses in both lobes, one of which had been drained surgically; at autopsy another abscess 18 cm. in diameter was found which had not been drained. The third patient had 15 abscesses distributed through both lobes. The fourth had two large abscesses in the right lobe; one was drained and one was not. The fifth patient had hundreds of small and minute abscesses scattered throughout both lobes of the liver, and the sixth had two large abscesses in the right lobe.

All of the patients who were known to have multiple abscesses died. There were no deaths in the group of patients who had single abscess of the left lobe of the liver. There were three deaths among those who were considered to have a single abscess of the right lobe. In two of the latter cases autopsy was not done and there may have been more than one abscess, while in the remaining case of the three there was only one abscess but the patient was not operated upon. In this case the lesion was diagnosed roentgenologically with barium enema as an inoperable carcinoma of the transverse colon with hepatic metastases.

In all seven of the cases in which autopsy was done the presence of amebae in the wall of the abscess was noted.

Three of the patients in this series had associated ulcerative amebic colitis. They died.

The average hospital stay of those that recovered was 40 days. The shortest stay was 21 days and the longest 95 days.

In only two (5 per cent) of the cases in this study were there any of the usual serious complications of this disease. In one case, which terminated in death, one of the several abscesses of the liver ruptured into the peritoneal cavity just before operation. In the other case there was amebic pleural empyema in the right chest. The abscess had extended through the right diaphragm and the patient recovered following surgical drainage.

Two patients with amebic abscess of the liver were observed in Peru.

CASE REPORTS

CASE 1: The patient, a 46-year-old Peruvian farmer, was admitted to the hospital with complaint of constant, dull aching in the right upper quadrant which had been present for one week. This pain, during the last two days, had become somewhat more severe and the patient had been unable to continue working. Mild anorexia was associated with the pain.

The temperature was 100.5°F. The patient complained of

some soreness in the right shoulder. On deep inspiration there was a mild aggravation of pain in right side of the chest. Two weeks before admission and for a period of several days there had been a moderate attack of dysentery with blood in the stools. This condition subsided after a few days without treatment.

The patient was well developed and well nourished. Tenderness was noted on deep palpation in the right upper quadrant. Fist percussion over the lower right thorax produced sharp stabbing pain.

No abnormalities were noted in examination of the blood and urine. X-ray and fluoroscopic examinations of the chest were negative for pathologic change. A gallbladder examination by x-ray showed normal filling and emptying. The icteric index was 12 units. Repeated (five) stool examinations were negative for amebae.

During the first two days of hospitalization the pain became more intense with a continued elevation of temperature. Exploratory operation, with the possibility of amebic abscess of the liver considered, was done five days after admission. A transverse incision was made in the right upper abdomen. There was a soft, fluctuant area about 3 inches in diameter on the lateral aspect of the right lobe of the liver. About 35 cc. of thin, cloudy, reddish-brown fluid was aspirated from this area. Emetine solution, 0.6 gm. in 10 cc. of water, was reinjected into the cavity. A soft rubber tissue drain was placed between the right lobe of the liver and the abdominal wall and the incision was closed. The postoperative condition of the patient was considered good.

Emetine, 0.3 gm. twice daily, was given for the subsequent ten days. The drains were removed on the seventh day after operation, and the wound sutures were removed on the eighth postoperative day. The temperature and pain gradually subsided. On the tenth day the patient was out of bed and afterward made rapid improvement.

Case 2: The patient, a Peruvian woman, 27 years of age, stated that three weeks previously she had had an attack of dysentery with blood in the stools which lasted for several days. Fever, nausea and pain in right upper quadrant developed at that time. The patient stated that she had been able to eat very little during the preceding three weeks and had lost a great deal of weight. During that time there had been occasional mild attacks of diarrhea without blood in the stool. Soon after the appearance of the pain in the right upper quadrant, the patient noticed swelling in the area, which had gradually become larger and more prominent.

Upon physical examination the patient was observed to be emaciated and apparently very ill. The skin was dry and the sclerae and skin were mildly icteric. The right diaphragm was elevated one interspace above the usual level. There was a bulging, soft mass in the right upper quadrant of the abdomen. In the center of this mass was an area about 2 inches in diameter over which the skin was thin and glistening as if an abscess were about to burst through.

The hemoglobin value in the blood was 42 per cent; erythrocytes numbered 2,225,000 and leukocytes 8,600. The icteric index was 21 units. Slightly elevated content of urobilinogen in the urine was noted. An x-ray film showed high elevation of the right diaphragm.

Supportive therapy, including intravenous administration of fluid and whole blood, was started immediately. At operation the following day brown-colored pus was encountered immediately under the skin. Suction drainage was used to evacuate the cavity, which was estimated to be 20 cm. in diameter in the greatest dimension. It was evident at that time that there was a great deal of destruction of the liver.

The patient was given emetine subcutaneously, 0.3 gm. twice a day for ten days, and supportive therapy was continued. During the first week after operation there was moderate improvement in that the patient regained some desire to eat and said that she felt somewhat better. The temperature dropped and for a few days remained at 99.6 degrees. It rose gradually during the next two days and an x-ray film of the chest made at that time showed there had been further elevation of the diaphragm. The eighth rib was resected to reach and drain a second abscess. There was only slight improvement following this procedure and even though blood transfusions, emetine and antibiotics were used the patient gradually became weaker and died four weeks after admission.

DISCUSSION

The prognosis for patients with a single amebic abscess of the liver is excellent and the number cured should approach 100 per cent in any series. In the presence of multiple abscess the mortality rate increases. Craig[1] in 1934 considered the prognosis grave in this disease and expected an over-all mortality rate of 25 to 30 per cent when all cases, both single and multiple abscesses, were included.

The mortality rate also will be affected by the general physical condition of the patient when first observed, by how early proper treatment is begun, and by the extent of damage to the liver.

Ochsner and DeBakey[3] in 1935 reported an over-all mortality rate of only 4.1 per cent in their series. This greatly influenced the change from open surgical drainage to that of repeated aspiration of the abscess cavity and subcutaneous injection of emetine hydrochloride. However, not all cases can be handled by this comparatively simple procedure. Manson-Bahr in 1945 reported that open surgical drainage was necessary in about 25 per cent of cases observed by him.

The use of open surgical procedure should be considered when: (1) it is demonstrated that an abscess has become secondarily infected; (2) it is considered inadvisable to pass an exploratory needle through an uncontaminated body cavity or into a dangerous area; (3) an abscess "points" in the epigastrium, that is, is situated in the left lobe of the liver; (4) an abscess has not responded to the aspiration method; (5) no pus is obtained after repeated aspirations although indications of the presence of pus are strong.

Open surgical drainage with emetine injected subcutaneously was the method used by the author because it had apparently been producing satisfactory results.

It is recommended, however, that the treatment as outlined by Ochsner and DeBakey[3] of repeated aspiration of the abscess and subcutaneous injections of emetine be considered the method of choice in cases of amebic abscess of the liver and that the open surgical drainage procedures be used only as indicated in the preceding paragraph.

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Rehabilitation of Patients with Hemiplegia

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SUMMARY

Many patients with hemiplegia can be rehabilitated. Physiological reflexes may be used in attempting to establish patterns of motion and are of definite aid in overcoming contractures. Physical and occupational therapy is of value.

PATIENTS with hemiplegia can be rehabilitated unless one or another of the following conditions exists: Senility, medical complications prohibiting activity, loss of learning ability, psychosis, lack of motivation, and (sometimes) atonicity.

In senile patients the protoplasm cannot meet the requirements of active existence and the organic structures of the body are worn out. The weakness of senility must be differentiated from atrophy of disuse, which can occur at any age and is correctable by exercise. The physiological age must not be confused with the chronological age. It is not uncommon to observe one patient who is 70 years of age to be physiologically younger than another who is 65 years old. Therefore, if the individual is physiologically capable, the chronological age is of no importance in relation to rehabilitation.

Medical conditions prohibiting rehabilitation include active intracranial bleeding and acute heart failure. Chronic heart failure is not a contraindication, providing activity is maintained within the limitations of cardiac compensation.

Loss of learning ability is the commonest stumbling-block encountered in patients who do not respond to rehabilitation efforts. The status of this particular faculty may be determined by psychological testing. By a variety of tests, the ability to remember may be conclusively established.[6] If the testing results are equivocal, therapeutic trial is indicated. Aphasia must not be mistaken for loss of learning ability. The aphasic patient may have an interruption in sensory reception or motor expression without any interference with memory centers.

Motivation is the keystone of rehabilitation. It is of two main types, (1) internal, and (2) external.[7] In internal motivation the impetus to activity arises from within the individual; in external motivation the impetus is provided from the outside. Internal motivation is frequently lost in chronic debilitating illnesses. In order to renew it, external motivation must be supplied as a stimulus. This is accomplished by demonstrating to the patient that he is capable of performing a movement which he did not consider possible. The realization that motion is possible serves as a stimulus to internal motivation.

Atonicity or flaccidity may be a barrier to rehabilitation. In many cases, however, the patient may be made ambulatory with the aid of a long leg brace.

Rehabilitation is started as soon as medical condition warrants. In cases in which paralysis has been caused by cerebral hemorrhage, activity must wait until all evidence of bleeding ceases. Patients who have had cerebral embolism or thrombosis can be started on treatment within 48 to 96 hours. Initially, atonicity is usually present. This pseudoflaccid stage later changes to a spastic stage. The muscles on the involved side begin to atrophy immediately as the result of disuse. The involved muscles will respond, by contraction, to electrical stimulation. Electrical stimulation can delay atrophy even in muscles in which peripheral nerves have been severed.[3, 5] Therefore, to minimize atrophy of disuse, the paretic muscles are electrically stimulated. In the later stages when hypertonicity appears, and with it some degree of voluntary motion, electrical stimulation is no longer indicated. The patient is then capable of performing some degree of voluntary effort.

During the atonic phase, it is important to maintain the range of motion in the joints. Contractures are liable to develop, particularly in older individuals. The most common site of contracture is the shoulder. Contracture of the ankle in plantar flexion, while relatively common, is more apparent than real. This will be dealt with in greater detail later. At this stage, motility is maintained by passively moving each joint through a complete range of motion. This procedure is performed at least once a day.

Teaching the patient the activities of daily living[2] is started at the onset of treatment. These activities consist of functions which are inherent in everyday existence, such as getting out of bed, standing, dressing, eating, and walking.

With the return of tone in the involved muscles, there is also some return of voluntary motion. The amount of voluntary motion is variable and depends on the site and size of the cerebral lesion. It has been pointed out[9] that the loss of willed movements is in proportion to the failure of the activating influence of the receptors to reach the motor mechanism through the pyramidal tract. Thus the long-lasting movements which are dependent upon sensory guidance suffer most. The arm suffers more than the leg, and the hand more than the arm. Furthermore, there seems to be a direct relation be-

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tween the degree of loss of voluntary movement and the degree of hypertonus. The greater the tonicity, the less the willed movement.

Hypertonicity in the legs affects the extensor muscles so that the knee is held extended and the foot is plantar-flexed and inverted. When the patient tries to walk there is an apparent foot drop, which prevents the leg's being carried through during the step. As a result the patient elevates the pelvis and tends to abduct the leg on the affected side while walking. A short leg brace with a 90° ankle stop is a definite aid in counteracting these effects. Patients with mild ankle clonus need only a light spring brace. If the clonus is more severe, a double bar brace is necessary.

There are several methods of training the step. One consists of applying pressure over the knee of the seated patient as he attempts to flex his hip. This stimulates the stretch reflex. Another method, for patients incapable of voluntary hip flexion, is the application of painful stimulus such as may be caused by bending down the toe.[4] The reaction is really a withdrawal reflex in response to a painful stimulus, as was shown by Sherrington on decerebrate animals. Kabat[8] expressed the belief that a pattern of motion may be established by constant repetition. When either the stretch or the withdrawal reflex is elicited, the hip, the knee and the ankle dorsiflex, and the foot everts. Apparent plantar flexion ankle contracture will disappear. In those cases in which true ankle contracture exists, reflex action may be used as an aid in stretching the contracture.

Parallel bars may be used in teaching ambulation. The patient first learns to stand and then to walk. Bars are better for this purpose than walkers, since they give the patient a sense of security in that he has something stable to grasp. From the bars the patient is graduated to a cane and finally may be able to walk without support.

Paresis of the arm is more difficult to overcome. Nevertheless good functional recovery as a result of overcoming atrophy of disuse is not uncommon. The tonic neck reflex (turning the head toward the involved side) may be used to aid in activation of the arm. It has been demonstrated that the strength of forward flexion and elbow extension can be increased by over 300 per cent when the tonic neck reflex is used to reinforce voluntary motion. In addition, strength in the arm can be further increased by as much as 200 per cent by overcoming atrophy of disuse in the course of treatment.[10]

The so-called "frozen shoulder," which not only interferes with the range of motion of the arm but is also a source of pain, may be treated by Mennel manipulations and by passive stretching. If the tonic neck reflex is utilized during the treatment of the frozen shoulder, an increase of 10° to 20° of forward flexion, abduction and external rotation may be obtained on passive movement. If the tonic neck reflex is neglected during stretching, the spasticity tending to produce adduction and internal rotation remains to be overcome. The range of motion attained may be maintained by pulley exercises. Here again the tonic neck reflex is of definite aid.

Occupational therapy procedures, which have the advantage of keeping the patient interested in improvement, are best suited to treatment of the arm. Functional treatment by occupational exercise should be started with the arm at shoulder level.[1, 11] The arm may be supported either on a table or by a sling suspension. Resistance is added as tolerated. With increase in strength, the support may be lowered so that work is done at a lower level, and ultimately the support may be removed. Then working position of the unsupported arm may be gradually raised so that it has to be held against gravity.

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Toxicology of Organic Phosphate Insecticides

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SUMMARY

The development of effective new insecticides has created potential industrial health hazards to people engaged in their manufacture and application, as well as to those with casual exposures. A group of these insecticides known as the organic phosphates is extremely toxic, destroying the enzyme cholinesterase and exerting a cholinergic action on the mammalian animal. A discussion of the origin, chemistry, and pharmacology of these compounds, along with a description of symptoms, diagnosis and treatment of poisoning is presented. Methods of prevention of poisoning and control measures for the safe use of these compounds are described.

INTENSIVE research in the development of new insecticides in the last few years has resulted in products such as DDT, DDD, chlordane and others which have proven to be a boon to agriculture and in the campaign against insect-borne diseases. However, these new compounds, besides being effective insect killers, are also toxic to humans and can be dangerous if improperly handled. Most recently a new group of compounds, the organic phosphates, has come into use and represents a potential threat to human beings.

Hexaethyl tetraphosphate (HETP) was developed in Germany, where it was known as "Bladan" and was considered for possible use in chemical warfare. Tetraethyl pyrophosphate (TEPP), also known under the name of Vapotone and other commercial designations, is the active toxic ingredient in HETP and was independently developed at the University of Chicago a short time ago.[8] Both these compounds are heavy, syrupy liquids freely miscible with water. On contact with moisture they readily hydrolyze and lose their toxicity; hence, unlike DDT, they have little residual action.

A third organic phosphate is parathion (also known as Thiophos, Alkron and by other commercial names) which is a deep brown liquid of low vapor pressure, some samples of which possess a characteristic odor. Chemically it is O, diethyl O, P-nitrophenyl thiophosphate. It is slightly soluble in water but completely miscible in many organic solvents including ethers, alcohols, and animal and vegetable oils. It is stable in a neutral solution but is rapidly hydrolized in the presence of alkalies, including soap. In actual application as an insecticide, the material may be used as a wettable powder or a dust.

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The organic phosphates are very effective in the control of a number of different pests. They are being widely used in the control of mites, codling moths, and other insects which may be resistant to DDT and the older insecticides.[7] Application to fruit orchards and other crops is made by a variety of means, including airplane spraying, mechanical spraying from tractors, and hand spraying.

In the period between January 1, 1948, and August 31, 1949, there were 49 cases of organic phosphate poisoning reported to the California State Department of Public Health, Bureau of Adult Health. One case was fatal. Three deaths due to parathion poisoning in other parts of the country were reported by Hamblin in May 1949,[4] and since that time the authors have had reports of two other fatalities outside of California. Faust[3] reported a typical case of tetraethyl pyrophosphate poisoning in September 1949. Poisoning has occurred among people engaged in the manufacture of these materials, in those compounding solutions containing them, in airplane pilots dusting crops, in agricultural workers, and in people inadvertently exposed (one such was a welder who cut into a pipe containing parathion).

PHARMACOLOGY

In experimental animals it has been demonstrated that the organic phosphates are readily absorbed through the intact skin and from the respiratory and digestive tracts.[5] In all reported cases in humans, absorption was through the skin or respiratory tract, and symptoms appeared within a brief period after exposure, indicating rapid uptake by the body. The compounds themselves are only slightly irritating when first applied to the skin, so there is no immediate warning sign as to the potential danger. If splashed in the eye, there is an intense miosis, resulting in temporary blindness.

The principal mode of action of the organic phosphates is the inactivation or destruction of the enzyme cholinesterase, producing a cholinergic action in mammals.[2] The muscarine-like effect is the underlying cause of the multitude of symptoms which have been recorded by various investigators throughout the country.

SIGNS AND SYMPTOMS

Observed cases have varied from those in which symptoms were mild and transient to those in which severe toxemia resulted in death. Early signs and symptoms include headache, nausea, vomiting, diz-

ziness, cramps, and constriction of the pupils. More severe poisoning is manifested by a feeling of tightness of the chest, diarrhea, difficulty in breathing, fibrillary twitching of the voluntary muscles, convulsions, and coma.

Death in acute poisoning may be due to any one of the following mechanisms:

1. Bronchial constriction with an outpouring of mucous secretions resulting in mechanical asphyxiation.
2. Central nervous system stimulation and eventual irreversible depression.
3. Stimulation and eventual depression of neuromuscular junctions.
4. Accidents occurring as a result of the visual or mental impairment.

Evidence concerning chronic toxicity and cumulative action is incomplete. However, studies are now under way to determine the effect of chronic exposure to dosages below those producing acute effects. It may be that with chronic exposure an irreversible destruction of cholinesterase can be produced. Experimental animals receiving sublethal doses have survived with no residual damage, presumably because they were able to reproduce enough cholinesterase to replace the amount destroyed by the insecticide.[6] However, further studies on this point are necessary.[1]

At present, diagnosis of intoxication with one of these compounds depends mainly on an awareness of the syndrome and on a high index of suspicion in areas where the chemicals are being used. Any person who may have come into contact with an insecticide, complaining of "blindness," blurred vision, headache, tightness of the chest or any other symptom listed above, should be suspected of acute organic phosphate intoxication. A laboratory finding of reduced cholinesterase activity in the plasma or erythrocytes is confirmatory evidence. However, interpretation of blood cholinesterase levels is difficult.

TREATMENT

Atropine is a specific therapeutic agent against the parasympathetic stimulation. Large doses (1 to 2 mg.) should be administered early and repeated frequently as indicated by the clinical picture. Postural drainage, and suction if available, should be used to remove the excess bronchial secretions and maintain a patent airway. Artificial respiration should be employed if breathing has ceased, and the concomitant use of oxygen may be life-saving.

The following reports are presented to illustrate the signs and symptoms of the disease, as well as the diversity of occupational exposures that have resulted in organic phosphate poisoning:

CASE REPORTS

A 31-year-old white male entomologist, employed by an agricultural experimental station, had been working with parathion intermittently for four months. One morning he arrived at an orchard shortly after 9 o'clock and took charge of the application of parathion which was already in progress. Fruit trees were being sprayed with a mixture containing 2 pounds of parathion (a 25 per cent wettable powder) per 100 gallons of water at the rate of 25 gallons per tree. The patient ran the sprayer while an assistant operated the tank and weighed and measured the ingredients. The sprayer had to be refilled about every 15 minutes, and at the refilling the patient added the ten pounds of powder containing parathion to the tank as the water was being pumped in. During the operation of the sprayer he was constantly exposed to drizzle of the spray. During the morning, he wore no protective clothing or mask other than wrist-length gloves. At noontime he reported to other personnel on the job that everything had proceeded satisfactorily but that he had a headache. In answer to specific inquiries he assured his co-workers that his headache was not severe and probably of no consequence. He went home to lunch and upon returning he was wearing a pair of coveralls in addition to cap, boots and gloves. At 3:25 the manager of the orchard visited the operations and had a conversation with the patient, who in no way indicated that he was aware of any reaction to the material.

The spray operation continued until approximately 4:05 p.m., at which time the patient informed his assistant that he felt dizzy. A few minutes later, while the assistant was cleaning the equipment, the patient became nauseated and vomited. He at first rejected a suggestion that he leave the orchard, but shortly thereafter he got into his car and started to drive home. He drove about a quarter of a mile and again became nauseated. He asked a young man to drive him home and arrived at his house at about 4:45 p.m. and told his wife that he was ill from parathion. He asked her to call a physician and ambulance and to instruct the ambulance to bring an oxygen tent. In the meantime, after help in undressing, he bathed. The physician arrived shortly after 5:00 p.m. and pronounced the patient dead at approximately 5:05 p.m. At no time during his brief illness did the patient receive atropine.

Autopsy did not reveal any other contributing information as to the cause of death, and it was attributed to poisoning by parathion. A postmortem specimen of blood showed no cholinesterase activity and contained one part of parathion per million parts of blood.

* * *

On July 8, 1949, at 8 a.m., three picking crews of 30 men each went into orchards to pick fruit. Two crews were assigned to blocks in the orchard which had been sprayed on June 27, 1949, with parathion spray powder, enough to give 2½ pounds of parathion per acre. The other crew went to a block sprayed on an earlier date.

The day became hot and sultry, with no breeze; the temperature was between 90° and 100°F. Between 12:30 p.m. and 8 p.m. 22 of the pickers working in the most recently sprayed blocks felt ill and quit work to lie down. Most of the men began to vomit. All 22 were taken to the nearest hospital where it was noted that they all had headache, pallor, nausea, vomiting and weakness, and that two or three complained of twitching of arm and leg muscles. They were all given 0.6 mg. of atropine sulfate intramuscularly. In 20 to 30 minutes all improved and vomiting ceased. Ten of the men were permitted to go home that evening, and the remainder who stayed overnight for observation were released the next morning.

Results of urinalysis in all cases were normal. In all cases there was a slight decrease in erythrocyte count and hemoglobin content, while leukocytes numbered between 14,000 and 20,000. Because of lack of facilities, blood cholinesterase determinations were not made.

Most of the men had taken their own lunches from home. Three or four had eaten at the mess hall provided in the orchard. Some had eaten pears from the orchard and others

had not; some had drunk from new containers and some from old containers of water. There was no evidence of any common food or any common source of water supply which was consumed by all of the men. The diagnosis in all cases was acute parathion poisoning caused by inhalation of vapors resulting from spray residue remaining from the spraying which had been done 11 days previously.

Reports of the remaining cases are presented in tabular form.

PREVENTION

Poisoning by this compound can be prevented if proper attention is given to safe methods of handling it and if all persons concerned appreciate its extreme toxicity. All contact with the bare skin must be avoided and natural rubber gloves must be worn when handling parathion. If any of the material gets on the skin it should be thoroughly and

Summary of Data Regarding Cases of Parathion Poisoning Reported to the California State Department of Public Health January 1, 1948, to August 31, 1949

Date	Type of Exposure	Signs and Symptoms	Remarks
1948	Spraying oranges with HETP.	Miosis, with partial loss of vision for 72 hours.	
1948	Spraying oranges with HETP.	Miosis, with partial loss of vision for 8 hours.	
1948	Pilot spraying from airplane with HETP. Refilled hopper several times.	Crashed. Had complained of poor vision during reloading.	Cause of crash not certain but believed to be due to miosis.
1948	Spraying nursery with HETP.	Pupillary constriction for 12 hours, tightness of throat.	
1948	Spraying citrus orchard with HETP and TEPP.	Pupillary constriction. Pulmonary congestion. Pharyngitis.	
1948	Spraying nursery and fruit trees with HETP and TEPP.	Pupillary constriction. Dyspnea.	
1948	Spraying field crop with TEPP.	Miosis; tunnel vision; lacrimation; tightness of chest. Diarrhea.	
1948	Spraying berries from helicopter with TEPP.	Miosis lasting 72 hours. Constriction of chest.	
1948	10-year-old, by observing pest control operator apply TEPP under and around house.	Headache; miosis; nausea; vomiting; muscular twitching. Hospitalized 40 days.	
1948	Smoking orchard with TEPP.	Tracheitis.	
8-25-49	Spraying beans with TEPP.	Substernal burning and tightness.	
8-12-48	Spraying beans with TEPP.	Dizziness, nausea, vomiting, tightness of chest.	
7- 1-49	Spraying from helicopter with TEPP.	Helicopter crashed. Pilot had pinpoint pupils lasting 4 days.	
10-15-48	Spraying with parathion.	Headache, weakness, nausea, perspiration.	
6-27-49	Mixed 15 per cent parathion powder with water and delivered to sprayers. Operated nurse rig.	Dizziness, nausea, vomiting, abdominal cramps, perspiration. Dyspnea; apprehension. Miosis. Auricular fibrillation.	Recovered with treatment with atropine, oxygen, calcium gluconate.
6-30-49	Mixed 15 per cent parathion powder with water and delivered to sprayers. Operated nurse rig.	Nausea, vomiting, miosis, dyspnea. Cyanosis, loss of consciousness. Fibrillary twitching of voluntary muscles.	Recovered with treatment with atropine, oxygen, calcium gluconate.
12- 3-48	Spraying with 1 lb. 15 per cent parathion—100 gallons of water. Spray got on face and chest.	Nausea. Tightness of chest. Heaviness of arms.	Myocardial infarction suspected but EKG normal.
Sept. 1948	Spraying with parathion from 6 a.m. to 2 p.m. on very hot day.	Started at 4 p.m. on day of spraying. Headache; miosis; nausea; vomiting; muscle spasm of legs; convulsions; coma.	Hospitalized five days. Recovered with atropine treatment. Loss of 20 lbs. weight.
8- 6-49	Pruning trees which had been sprayed with parathion 7 days earlier.	Weakness; nausea; vomiting. Hypotension (80/50); bradycardia. Athetoid movements. Pain in right hand.	Good response to atropine.
4- 6-49	Female employee packaging 25 per cent wettable powder parathion in a chemical plant.	Became ill at home several hours after exposure. Chest pain; diarrhea; weakness.	Good response to atropine. Low plasma cholinesterase activity during illness.

(Table continued on next page.)

(Continued from preceding page.)

Date	Type of Exposure	Signs and Symptoms	Remarks
June, 1949	Spraying with parathion.	Headache; nausea; vomiting; abdominal cramps; dyspnea; cough; frothy sputum.	
May, 1949	Welding and cut into a pipe containing parathion.	Onset within ten minutes; nausea; vomiting; vertigo; headache.	Hospitalized one day.
Aug., 1949	Had sprayed with parathion, HETP, TEPP, and other insecticides intermittently for 2½ years. Mixed sprays and weighed out wettable powder.	Headache; diarrhea; nausea; vomiting; anorexia.	Insidious onset. Low plasma cholinesterase.
7-27-49	Night superintendent in plant that packages parathion.	Nausea; vomiting; headache; following packaging of parathion.	
8-12-49	Crop dusting with parathion.	Dry skin; nausea; chest pain; pallor and apprehension.	
6-30-49	Spraying crops with parathion.	Nausea; salivation; perspiration.	
9-15-49	Foreman in nursery where parathion was sprayed.	Nausea; myalgia; miosis; dyspnea, diarrhea.	Good response to atropine.
7- 8-49	22 pickers working in an orchard that had been sprayed on June 27, 1949. Very hot day. Onset of symptoms 4½ to 12 hours after picking started.	Pallor; nausea; vomiting; sweating; weakness. W.B.C. elevated. R.B.C. lowered. Urinalyses negative.	Remarkably rapid response to atropine.
8-23-49	Sprayed fruit grove with parathion all day. Drove tractor and made up parathion solution.	Headache; vertigo; nausea; vomiting. Death occurred 8 hours after starting work.	Received no treatment. Dead on arrival of M.D. Postmortem blood had no cholinesterase activity.

quickly washed off with copious amounts of soap and water. Workmen should be provided with freshly laundered coveralls and should wear fresh clothing each day, including socks and underwear. In addition, sprayers or others who are likely to be drenched with the chemical should be provided with a cellophane cape and hat or other liquid-repellent garment, as ordinary clothing will prove to be merely a reservoir for further absorption. Inhalation should be avoided by use of a chemical cartridge respirator, full face-piece type equipped with GMC-1 canister.* Workers should bathe with soap and water after using the material, and contamination of food and tobacco should be avoided. An added safeguard is to avoid prolonged exposure. This may be accomplished by rotating workers on different job assignments so that no one worker deals with the organic phosphates day after day for a long period.

The question has arisen as to the wisdom of providing atropine to exposed workers, to be taken if symptoms of poisoning occur. The proponents of this procedure argue that it may be life-saving, while others feel that it would lead to self-medication in many cases where symptoms were due to something other than organic phosphate poisoning. A practical procedure may be to leave a small supply of atropine with a foreman or other responsible person, who should be instructed to telephone a physician should symptoms develop in any exposed workers. He could then be informed whether or not to administer the atropine while waiting for the doctor's arrival.

To date, no cases of poisoning due to ingestion of food sprayed with these materials have occurred. It is recommended that there be at least a 30-day interval between application of parathion and harvesting of the crop. If this is heeded, it is believed that there is no danger to the consumer.

*Sprayers should check with their local health department or department of agriculture for the best kind of respirator.

Grateful acknowledgment is made to the many physicians who have supplied information about cases which they have diagnosed and treated.

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CASE REPORTS

- Homologous Serum Hepatitis Following Operation on the Biliary Tract
- Electrocardiogram Immediately Before and After Septal Infarction
- Tuberculous Fistula in a Postpartum Uterus

Homologous Serum Hepatitis Following Operation on the Biliary Tract

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Report of Three Cases

WITH the ever-increasing use of transfusions of blood and plasma, and the use of blood products, it is pertinent to emphasize that homologous serum hepatitis may follow these procedures and may confuse the issue in diagnosis, especially in biliary tract disease. Since it may occur following operation on the biliary tract in cases in which jaundice was present before operation, if jaundice should recur two to six months postoperatively the surgeon should be alert to the possibility of serum hepatitis as a cause, lest unnecessary reoperation be done.

Brightman[2] and Neefe[5] have described the clinical aspects of homologous serum hepatitis and have adequately reviewed the literature. It is now evident that the pooling of plasma and blood in commercial and hospital blood banks increases the risk of infecting patients with the virus of hepatitis. Because of the prolonged incubation period (two to six months) the relationship between the administration of blood or plasma and the subsequent development of jaundice in hepatitis may be overlooked. Brightman[2] noted that the New York State Department of Health in 1947 reported that hepatitis developed in 29 of 649 patients followed for six months after receiving American Red Cross surplus plasma, an incidence of 4.5 per cent. This was lower than the 7.3 per cent incidence noted by Spurling[8] in England. Scheinberg[6] reported the mortality rate from homologous serum hepatitis at Peter Bent Brigham Hospital in 1945 was 36 per cent.

The committee on blood and blood derivatives of the American Red Cross[1] urged that plasma be used only in those emergencies in which safer agents such as whole blood or serum albumin are not available, and recommended that patients who have received human plasma or serum should not serve as donors within six months afterward, even though they felt perfectly well. It is necessary to regard a recent transfusion or the recent use of human serum as significant etiologically when any patient with jaundice is being studied.

Schiff[7] emphasized the importance of homologous serum hepatitis in the differential diagnosis of jaundice, with particular respect to (a) metastatic neoplasm of the liver in patients who have had a recent resection of a malignant tumor and who received blood or plasma; (b) stricture or stone of the common duct in patients who have had recent operations upon the biliary tract, usually cholecystectomy, and (c) neoplasm as a cause of painless jaundice in middle-aged or older people. He reported six cases in detail. He observed 11 cases in one year.

When the surgeon is confronted with recurrent jaundice in a patient upon whom he has recently operated to extract stones from the common bile duct, it is important to accurately establish whether the jaundice is on the basis of obstruction again or is due to the virus of hepatitis.

Following are reports of three cases in which jaundice recurred following common duct operation and was due to homologous serum hepatitis.

CASE REPORTS

CASE 1: A 42-year-old physician was discharged from the army because of severe recurrent attacks of precordial pain associated with nausea and vomiting. The patient had never had an operation. He had had attacks of severe upper abdominal pain since 1941.

Results of extensive laboratory and cardiovascular studies were within normal limits. In August 1946, the patient first noted jaundice and was admitted to the Cedars of Lebanon Hospital. There was no fever. Pronounced tenderness in the right upper quadrant of the abdomen was noted. The icteric index was 32 units and it rose within a few days to 38 units. The blood protein level was depressed to 5.4 gm. per 100 cc. An electrocardiogram was normal.

At operation August 23, 1946, the gallbladder, which was thickened and contained stones, was removed. Four large stones were removed from the common bile duct. A T-tube was inserted into the common duct. The appendix was removed and the abdomen was closed. During and after the operation, the patient received 500 cc. of whole blood (individual donor) and 500 cc. of pooled plasma. The icteric index slowly declined. The patient was discharged from the hospital September 7, 1946, much improved. Cholangiograms a few days later showed the common bile duct to be patent and the T-tube was removed. There was no further drainage. The icteric index was normal by September 24 and the patient had made a normal recovery. Thirty-eight days after the operation, scleral icterus was noted again. It became progressively more severe and was associated with nausea and upper abdominal distress. The urine became dark, the stools lighter. Increased fatigability was noted by the patient. There was no pruritus. Because of the presence of bile in the stools, a diagnosis of hepatitis was entertained. The patient wished to go to Minnesota for further study. The following is a summary of the findings from the University of Minnesota Hospital:

The patient was moderately icteric and not acutely ill. There were no masses palpable in the abdomen. The liver was thought to be somewhat smaller than normal. The immediate impression was of recurrence of common duct stone.

The hemoglobin content on admission was 12.7 gm. per 100 cc. of blood. Leukocytes numbered 5,200 with 72 per cent neutrophils and 25 per cent lymphocytes. The blood urea nitrogen level was 12 mg. per 100 cc. The plasma

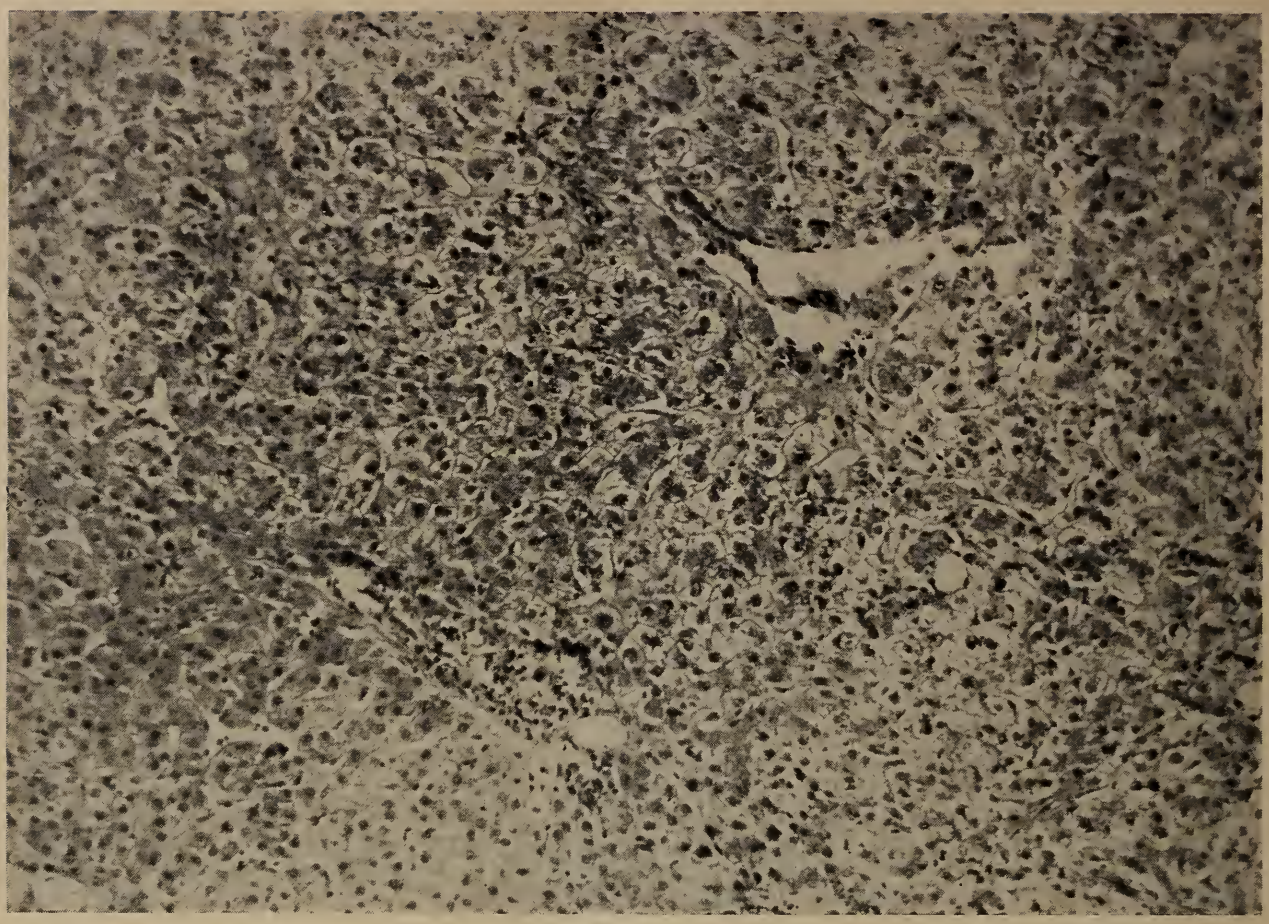

Figure 1.—Microphotograph, *Case 1:* Low-power field showing disorganized pattern of hepatic cells, diffuse bile thrombi—mostly intracellular—cytoplasmic vacuolation and slight reticulum-cell hyperplasia. Within lobules there is no significant inflammatory cell infiltration.

content of proteins was 6 gm. per 100 cc. However, liver function data was strongly suggestive of jaundice of parenchymal type and certainly not characteristic of simple obstructive jaundice. Operative intervention was deferred and the patient was transferred to the medical service Oct. 10. In the next ten days, jaundice increased greatly, the serum bilirubin reaching a maximum of 27.6 mg. per 100 cc. Cephalin cholesterol flocculation test was markedly positive. There was a high degree of exclusion of urobilinogen from the gastrointestinal tract, and a relative increase in the amount of urobilinogen being excreted in the urine. The patient's clinical condition remained static; at no time did he appear to be acutely ill. Duodenal drainage with magnesium sulfate was undertaken three times without avail. Because of the difficulty in differential diagnosis, a biopsy specimen was taken from the liver. The pathological report was as follows:

Microscopic: Section showed a mild portal infiltration chiefly by mononuclear leukocytes with scattered eosinophils and polymorphonuclear leukocytes. There was no increase in portal connective tissue and no bile duct proliferation. The liver cord cells surrounding the central vein were swollen and pigmented. Many of the reticuloendothelial cells along the sinusoids contained bile pigment. Bile capillary thrombi were numerous particularly in the central zone. A few scattered degenerating liver cord cells were noted and there were a few regenerative forms.

Comment: A number of pathologists reviewed the slide and, although there was some divergence of opinion, the majority interpreted the findings as consistent with obstructive jaundice.

About Oct. 20 the jaundice began to diminish. Coincidentally, there was pronounced and rapid increase in the rate of excretion of urobilinogen in the feces, and by Oct. 25 it had reached 192 Ehrlich units per 100 gm. Urinary excretion of urobilinogen, which previously had been at a rate of 1 mg. per day, reached 42 mg. per day. There was considerable decrease in the serum bilirubin to a total of 7.9 mg. per day at the time of discharge. It was thought that the extent of increase in the fecal urobilinogen was more in line with resolving hepatitis than with extrahepatic obstruction due to stone. The results of the liver biopsy, although favoring obstructive jaundice, were still somewhat equivocal. The patient was discharged Oct. 25 to return to his home.

The patient remained well with no jaundice or other symptoms. The final diagnosis was homologous serum hepatitis.

Case 2: The patient, a woman 22 years of age, had had cholecystectomy with common duct drainage on Jan. 31, 1948, at St. John's Hospital in Santa Monica. Postoperatively the patient received 500 cc. of pooled plasma and 30 cc. of human albumin to overcome a depression of blood pressure. Convalescence was uneventful and the patient was discharged from the hospital on Feb. 11, 1948. The T-tube was removed on March 5 after it had been clamped for a week when cholangiogram showed no further obstruction or stones. Sixty days after operation there was onset of anorexia and nausea with upper abdominal distress, fever, dark urine and light stools. The icteric index was 23 units. Leukocytes numbered 6,350. Jaundice was observed clinically. The liver edge was palpated two finger-breadths

below the right costal margin and was tender. The thymol turbidity test reached 19 units. Bile was present in the urine. No other tests of liver function were done at the time as it was the impression of the medical consultant that the patient had homologous serum hepatitis. After three weeks of high-protein, high-carbohydrate, high-vitamin diet and bed rest, the patient made good recovery and resumed full normal activity in six weeks. The liver was no longer enlarged or tender. Cephalin cholesterol flocculation was normal. The patient remained well.

Case 3: A white male, 63 years of age, was admitted Oct. 1, 1946, to Cedars of Lebanon Hospital with a history of pain in the right upper quadrant of the abdomen, recurrent nausea, vomiting and jaundice. The admission diagnosis was acute cholecystitis, common duct stone with obstructive jaundice. There was tenderness in the right upper quadrant of the abdomen. The gallbladder was palpable. The icteric index was 34 units. The patient was prepared for cholecystectomy. On Oct. 9, there was a severe reaction to amino acid solution given intravenously. The patient went into a state of deep shock and collapse for which 500 cc. of pooled plasma was given. On Oct. 12 a blood transfusion (individual donor) was given because of anemia. The hemoglobin, which was normal before the protein reaction, had dropped to a value of 50 per cent. On Oct. 22, the gallbladder, full of small stones, was removed. The common bile duct was opened and gravel was removed. A cholangiogram taken during the operation showed no further obstruction and a T-tube was inserted into the common duct. The patient was given 500 cc. of whole blood (individual donor) during the operation. The postoperative course was uneventful. The T-tube was clamped for one week. A cholangiogram on Oct. 31 showed no abnormality. The patient noted onset of painless jaundice on Feb. 11, the 112th day following operation. The stools were normal in color at first and then became acholic. The urine was dark. The liver was tender and palpable, and the spleen was palpable 3 cm. below the costal margin. Jaundice deepened rapidly until the icteric index reached 300 units. On Feb. 19 the icterus began to subside. On Feb. 13 the icteric index had been 267 units; on Feb. 21 it was 95 units. The patient had been treated with bed rest, high-protein diet, glucose administered intravenously, vitamin K, choline, methionine and vitamin B complex. Discharged Feb. 22, the patient remained well.

SUMMARY

Cases of homologous serum hepatitis may be overlooked because the condition is not usually considered in the differential diagnosis of jaundice. It is essential that it be suspected particularly if there is a history of illness or an operation requiring transfusion of blood or plasma two to five months before the development of jaundice, even if the operation was performed upon the biliary tract. This suspicion may be confirmed by demonstration of positive signs of hepatocellular jaundice by liver function tests. The indiscriminate use of pooled plasma is to be condemned because of the hazard of homologous serum hepatitis.

Three cases have been presented to illustrate that recurrent jaundice after biliary tract operation may be due to homologous serum hepatitis.

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Electrocardiogram Immediately Before and After Septal Infarction

Report of a Case

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THE following case report is presented to illustrate graphically two recently published statements. The first is from the University of Oregon Medical School syllabus on Electrocardiography,[1] soon to be published as a textbook: "Coronary disease may also exist in the complete absence of electrocardiographic abnormalities." The second is from an article by Gordon Myers and co-workers:[2] "Little or no attention has been devoted to the diagnosis of septal infarction in the current textbooks and monographs on electrocardiography."

The authors of both statements report cases in which the diagnosis was proven by autopsy, showing that right bundle-branch block due to septal infarction was differentiated from that due to other causes by the direction of the initial phase of the QRS complexes in leads from the right precordium. Uncomplicated right bundle-branch block was manifested by an initial R wave, a subsequent downstroke or coarse blurring, and a secondary late upstroke, whereas right bundle-branch block associated with septal infarction was characterized by an abnormal Q wave and a later R wave in these leads.

CASE REPORT

The patient, a 47-year-old male turkey-grower, was first observed on the afternoon of May 31, 1949. The present illness had begun two months previously with onset of indigestion. Any food caused indigestion. There had been no pain in the chest, but pain in the arm, running down to fingers, was a frequent occurrence. The patient took baking soda habitually for relief, with seeming success. He said that when mowing the lawn he had to stop and rest frequently because of pains in both shoulders. On the day he was first observed, repeated attacks of indigestion had occurred since morning, and with them for the first time there was pain in the chest. Stooping over to pick up baby turkeys would initiate a spell.

The patient was well-nourished, and appeared to be about the stated age. He was in no apparent distress. Heart sounds were regular and not otherwise abnormal. The blood pressure was 130 mm. of mercury systolic and 80 diastolic. An electrocardiogram tracing (Figure 1, *a*), taken about 4 p.m., was considered to be normal.

A prescription was given for nitroglycerin tablets. 0.3 mg., to be taken as a therapeutic test for the spells. The patient was told to return next morning to report. It was intended at that time to attempt to reproduce the pain and take further tracings.

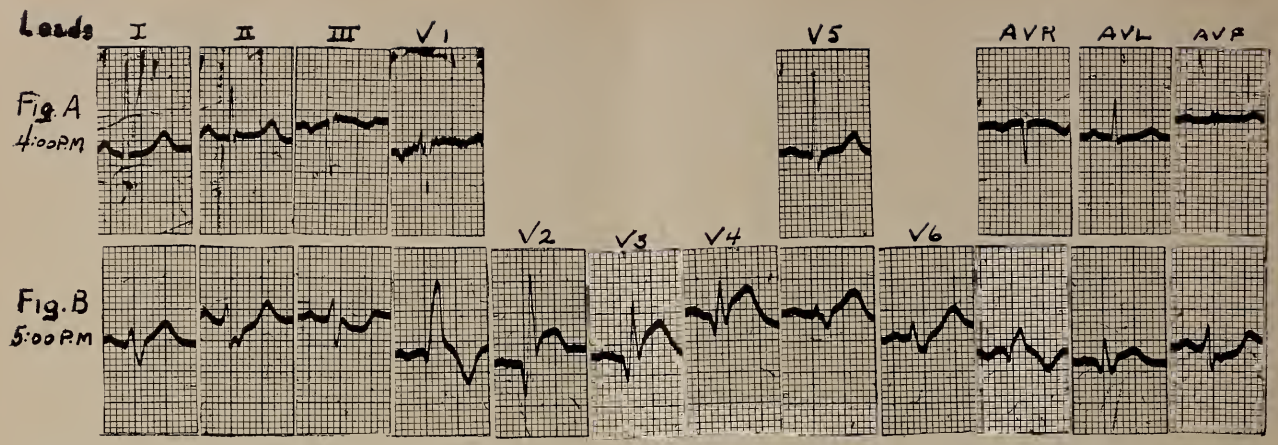

Figure 1.—*Top strip:* Electrocardiogram considered normal. The left axis deviation could be accounted for by the horizontal position as shown by AVL resembling V_5. V_1 is shown to demonstrate the presence of an initial R wave in the right ventricular lead.

Bottom strip: Electrocardiogram taken one hour later. The main consideration is the sudden appearance of right bundle-branch block, with the disappearance of the early R wave in V_1 and its replacement by a Q wave. Lead V_1 now shows a tall late R wave and an intrinsicoid deflection beginning 0.1 second after the beginning of the QRS complex, whereas lead V_6 shows the R wave to have an intrinsicoid deflection of about 0.02 second followed by a broad slurred S wave.

The changes shown are characteristic of right bundle-branch block. The early R wave in V_1 (*top strip*) is a normal wave produced by early left-to-right activation of the septum. Its disappearance and replacement by a Q wave therefore constitutes evidence of infarction of the septum. The initial Q wave in V_1 (*bottom strip*) represents a left ventricular cavity potential transmitted through an inert septum. According to Myers[2] the tall late R wave (V_1, *lower strip*) is "derived presumably from activation of an uninfarcted outer wall of the right ventricle over the aberrant pathway." The abnormal Q waves and RS-T displacements in leads V_3 and V_4 indicate continuation of the septal infarct into the anterior wall of the left apex.

Twenty minutes later, the patient was assisted back to the office with excruciating substernal and arm pain obviously overshadowing any previous attack. The attack had occurred in a drug store, and as two tablets of nitroglycerin gave no relief, he was brought back to the office by car. Forty-five milligrams of morphine sulfate—including 15 mg. intravenously—was required to subdue the pain appreciably.

From an electrocardiogram (Figure 1, *b*) taken an hour after the first one, it was at once apparent that pronounced myocardial insult had suddenly occurred.

The patient rapidly went into cardiac failure, but maintained a vegetative existence for two weeks with constant supplemental oxygen. No autopsy was obtained.

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Tuberculous Fistula in a Postpartum Uterus

Report of a Case

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IN a careful survey of the literature no previous report of a case of tuberculous fistula of the uterus was found. There are scattered reports of tuberculous endometritis, but in only rare instances was this disease not accompanied by tuberculosis elsewhere in the body. The case of tuberculous endometritis, complicated by fistula formation, here reported, appears to be the first in medical literature.

CASE REPORT

A 22-year-old gravida II, para I, was observed Oct. 21, 1946, in early pregnancy. The date of last menses was Aug. 10. The previous child had been delivered June 4, 1946. Except that the patient had a left inguinal hernia for which a truss was worn intermittently, the first prenatal course, delivery and postpartum period were without unusual incident.

Results of an examination were normal and the hernia was not palpable. At no time during the prenatal course was the temperature elevated, except for a day in Jan. 1947, when the patient had a cold. Records of the Los Angeles County General Hospital where the patient was sent for delivery showed that labor began without inducement on May 25, 1947, and within three hours the baby was delivered spontaneously. The placenta apparently was completely delivered. The postpartum course was somewhat febrile, with temperature ranging between 99° F. and 102° F. Penicillin was given. However, fever and night sweats were present during the entire stay in the hospital. The patient was dismissed on the fifth postpartum day. An intern reported that the uterus was involuting normally, being three finger-breadths below the umbilicus, but that there was generalized abdominal tenderness. The lungs were reported clear to auscultation.

On June 12, 1947, 17 days postpartum, the patient again consulted the author with complaint that the uterus had not gone down at all and that she felt that there must be another baby present. At that time the temperature was 103° F., and the patient stated that it had been elevated since she had been at home and that night sweats had become progressively worse from the time she left the hospital.

Upon examination it was noted that the uterus extended above the umbilicus. Attached the uterus and extending to within 3 cm. of the xiphoid process was a firm, trough-like mass in the midline. It was about 8 cm. wide and was attached to the anterior abdominal wall. A diagnosis of metritis with possible rupture of the uterus was made. At that time it was believed that the trough-like mass was omentum, attempting to wall off a rupture site in the uterus.

The patient was hospitalized and a diagnostic dilatation and curettage done. The curette passed up beyond the fundus of the uterus into this trough-like process and could be felt under the skin, 3 cm. below the xiphoid process. Curettings gently taken from this area and from the uterus revealed tuberculosis. X-ray films of the chest revealed fluid in the base of the left lung and the patient was returned to the Los Angeles County General Hospital. Sputum specimens examined there were never positive for tubercle bacilli.

An extremely febrile course followed and the patient was given streptomycin. By Aug. 1, 1947, the mass was no longer palpable. On Aug. 25, exploratory laparotomy was done. Inoperable tuberculous peritonitis was found. The pelvis was so infiltrated with tubercles that none of the organs except a small portion of the right tube were recognizable. A plaque 8 cm. wide and 1 cm. thick extended from the bladder to above the umbilicus. The peritoneum was studded with granules. Two hundred cc. of straw-colored fluid was removed and a biopsy specimen of the tuberculous tissues was taken. Streptomycin was continued postoperatively. The abdominal wound healed without incident and the patient was discharged Sept. 18, 1947.

Follow-up x-ray films of the chest have shown no abnormality. The mass up the midline of the abdomen is gone entirely. Menstrual periods have been normal. The patient is active and has no discomfort.

About July 1, 1947, while the patient was in the hospital, her year-old son was also admitted and, in spite of streptomycin therapy, died of tuberculous meningitis Dec. 16, 1947. The remaining child and the patient's husband are living and well.

The tuberculous endometritis was undoubtedly present during the pregnancy and the diseased myometrium ruptured during labor. The omentum, in its attempt to wall off the area, formed the walls of the fistula which, fortunately, never became a draining sinus. With streptomycin, the active spread of the endometritis was halted and spontaneous regression occurred. Thus, the fistula probably was a direct result of the rupture of a tuberculous uterus during labor.

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California MEDICINE

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EDITORIAL

The Hess Report and What It Means

In 1948 a committee of the House of Delegates of the American Medical Association was given the duty of studying the problem and status of "Hospitals and the Practice of Medicine." The chairman of this special committee was Dr. Elmer Hess of Erie, Pennsylvania. Hence, it became known as the Hess Committee and its reports of various times became known as the Hess Reports.

The progress report given to the House of Delegates at St. Louis in December 1948 merely outlined some principles and ways by which the committee would seek facts to enable it to render an opinion.

In June 1949, at Atlantic City, Dr. Hess reported for the committee.

He called attention to the fact that in many or most states the practice of medicine by corporations or unlicensed individuals is illegal. He also called attention to the Principles of Ethics of the American Medical Association (Chapter II, Article VI, Section 6) wherein the disposal by a physician of his services to such a party, where there is exploitation of the physician's services for the financial profit of such agency, is declared unethical. "Therefore," Dr. Hess stated in the report, "hospitals and medical schools cannot charge patients fees for medical services rendered by physicians even though the physicians are full time employees of an individual or of an institution."

Dr. Hess pointed out that these basic principles should be definitely understood and confirmed. Then he recommended that hospitals or other lay groups that would not cooperate within ethical and legal limits, and had been found guilty, should be removed from the approval list of the American Medical Association on order of the Judicial Council. This is the point on which much later misunderstanding arose.

The Reference Committee of the House of Delegates recommended approval of this "Hess report" and it was so approved.

Thereafter the Board of Trustees was given legal advice that the board had no right legally to try hospitals or other lay groups as to their lack of cooperation. Also, that as the American Medical Association had no legal authority to state how hospitals should carry on their business, the American Medical Association could not legally carry out this provision of the Hess report. The Board of Trustees therefore refused to institute any action and asked the House of Delegates to rescind its action approving the Hess report.

Therefore, at Washington in December 1949, the House of Delegates reconsidered the whole problem, but refused to rescind the Hess principles and pointedly reaffirmed its belief in those principles stated in the Hess report, and directed that action by the Board of Trustees be deferred *only* until all legal requirements were met in order to insure that all action taken should comply with the law.

Thereafter, the American Hospital Association in March 1950, in a distributed brochure, quoted resolutions defining that in its opinion radiologic, pathologic, anesthesiologic and psychiatric departments are component parts of the hospital organization and are included properly in a "patient-day" of hospital care. It definitely branded certain designated branches of medicine as hospital functions rather than professional medical care functions. It also erroneously reported that the Hess report had been rescinded.

This apparently caused much unrest and resentment in many quarters and it was felt that definite unequivocal action had to be taken by the House of Delegates in San Francisco.

In June 1950, therefore, the final (to date) Hess report was presented to the House of Delegates. It was then referred to a Resolutions Committee for study and report. Open hearings were held by this committee and its recommendations made. The House of Delegates then acted and this is essentially what it adopted:

1. It reaffirmed the basic principles of the Hess report in separating professional services from those which are the functions of the hospitals.

2. It called attention to procedures by which legally a physician (not the hospitals) may be tried for unethical conduct.

3. It adopted the following: "If and when a physician is found to be unethical by the proper authorities as established through channels specified in the Constitution and By-Laws, and he is still retained on the staff of any hospital approved for resident or intern training by the Council on Medical Education and Hospitals, it shall be the duty of the Judicial Council to request the Council on Medical Education and Hospitals to show cause as to why that council should not remove such hospital from the approved list under the assumption that the hospital is just as unfit for the training of young physicians for unethical reasons as it is unfit because it may not or does not have proper filing systems for its laboratory or clinical records."

4. It stated:

a. "A physician should not dispose of his professional attainments or services to any hospital, corporation or lay body by whatever name called or however organized under terms or conditions which permit the sale of the services of that physician by such agency for a fee.

b. "Where a hospital is not selling the services of a physician, the financial arrangement, if any, between the hospital and the physician properly may be placed upon any mutually satisfactory basis. This refers to the remuneration of a physician for teaching or research or charitable services or the like. Corporations or other lay bodies properly may provide such services and employ or otherwise engage doctors for those purposes.

c. "The practice of anesthesiology, pathology, physical medicine and roentgenology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine."

Undoubtedly it will take time to adjust all difficulties. However, the basic principles in this problem have been enunciated and the procedures necessary to support them are described.

Honorable bodies given definite precepts and rules of conduct usually adjust themselves and embrace the right.

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NOTICES AND REPORTS

Executive Committee Minutes

Tentative Draft: Minutes of the 222nd Meeting of the Executive Committee, San Francisco, June 15, 1950.

The meeting was called to order by Chairman Donald D. Lum in Room 212 of the St. Francis Hotel, San Francisco, on Thursday, June 15, 1950, at 3:00 p.m.

Roll Call:

Present were President Cass, President-elect MacLean, Speaker Alesen, Council Chairman Shipman, Auditing Committee Chairman Lum and Editor Wilbur. A quorum present and acting. Present by invitation were Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Legal Counsel Hassard and Mr. Clem Whitaker, Jr., of public relations counsel.

1. *Time and Place of Interim Session, House of Delegates:*

After discussion, it was regularly moved, seconded and voted that the interim session of the House of Delegates, voted by the Council at its meeting of May 27, 1950, be held on December 2 and 3, 1950, in Sacramento.

2. *Nominations for Secretary-Treasurer:*

It was regularly moved, seconded and voted that Dr. M. Laurence Montgomery be named Assistant Secretary-Treasurer, in compliance with action of the Council, to serve during the interim prior to appointment of a Secretary-Treasurer.

It was regularly moved, seconded and voted that Dr. Albert C. Daniels of San Francisco be nominated to the Council for appointment as Secretary-Treasurer.

3. *San Diego Blood Bank:*

Discussion was held on the San Diego Blood Bank and the possible advance of loan funds for conversion of this bank to a community-type blood bank as a part of the statewide system. Pending receipt of further information of the conditions in the existing blood bank, no action was taken.

4. *Public Policy and Legislation:*

It was regularly moved, seconded and voted that assistance and cooperation be given to the Los Angeles physicians who are combating a proposed antivivisection initiative in that county.

After discussion of various matters, it was regularly moved, seconded and voted to appropriate up to $15,000 additional funds to the Committee on Public Policy and Legislation to meet the approved requirements of that committee.

5. *National Society for Medical Research:*

On motion duly made and seconded, it was voted to continue the contribution of $500 for the coming year to the National Society for Medical Research.

6. *Resolutions to House of Delegates:*

Discussion was held on the position of the Council with regard to offering possible amendments to actions taken at the 1950 House of Delegates on oaths of office required of officers, employees and members of the House of Delegates. It was agreed to poll the members of the Council to solicit their suggestions for this and other matters to be placed on the agenda of the interim meeting of the House of Delegates.

7. *Publication of Tuberculosis Papers:*

A request from the California Tuberculosis & Health Association for authority to publish papers from its annual meeting as a supplement to CALIFORNIA MEDICINE was discussed and it was regularly moved, seconded and voted to leave such publication at the discretion of the Editor and the Editorial Board.

8. *American Legion, California Department:*

A request from the American Legion, California Department, for physicians to observe certain practices in treating veterans whose cases might come within the scope of the Veterans Administration, was discussed. It was pointed out that California Physicians' Service has already brought this matter to the attention of its professional members and it was ordered that the American Legion be so notified.

9. *Hawaii Tour Tickets:*

The Executive Secretary asked for instructions for the distribution of airline transportation accom-

modations to Hawaii which have come to the Association through its sponsorship of an organized tour. On motion duly made and seconded, it was voted to offer these tickets to employees in the Association office.

10. *Better Business Bureau of San Francisco:*

On motion duly made and seconded, it was voted to contribute $25 to the Better Business Bureau of San Francisco as a gesture of appreciation for its cooperation.

11. *Expenses of County Society Executive Secretaries:*

The Executive Secretary reported on the cost of travel and other expenses of county society executive secretaries in attending Council meetings, in response to a request made following the May 27 Council meeting. Transportation costs for nine county society executive secretaries were reported to total from $192 to $232, depending on the location of the meeting. It was regularly moved, seconded and voted that the Association bear the expenses of these county representatives to regular committee meetings scheduled in advance of Council meetings but that additional costs for attendance at Council meetings be an obligation of the county societies.

12. *Council Minutes:*

The Executive Secretary reported that amendments had been proposed for Minute No. 28 of the Council meeting of May 27, 1950. On motion duly made and seconded, it was voted to approve an amendment to this minute prior to its publication in California Medicine.

13. *Committee on Advertising:*

Discussion was held on the advisability of accepting certain types of advertising in the journal which might be in conflict with the policies of the Association. It was agreed that a member of the Council be invited to sit with the Committee on Advertising to advise the committee when such matters were before it.

14. *Legal Department:*

Mr. Hassard discussed several items and suggested the advisability of exploring the educational standards of several of the healing arts. It was regularly moved, seconded and voted to authorize legal counsel to look into the educational provisions of chartered schools offering medical or ancillary courses.

15. *World Medical Association:*

It was regularly moved, seconded and voted to request Dr. John W. Cline, A.M.A. representative to the World Medical Association, to represent the California Medical Association at the next annual meeting of W.M.A.

16. *Chamber of Commerce of the United States:*

A request from the Chamber of Commerce of the United States to take out a membership in that body was discussed and ordered referred to the American Medical Association.

17. *Sectarian Medicine:*

A request from a county medical society as to whether or not the practice of homeopathic medicine and holding oneself out to be a homeopath constituted sectarian medical practice in violation of county society by-laws prohibiting such practice, was discussed. It was agreed that the practice of homeopathic medicine in itself did not constitute sectarian practice but that in the instance before the committee, the county society should be advised to exercise its own judgment as to the ethical nature of the telephone book listings of the present applicant.

18. *C.M.A. Mailing List:*

It was regularly moved, seconded and voted to permit the California Heart Association to use the mailing list to send programs of its meeting to C.M.A. members.

19. *Committee on Emergency Medical Service:*

It was regularly moved, seconded and voted to recommend to the Council the appointment of Dr. Frank F. Schade of Los Angeles as an additional member of the Committee on Emergency Medical Service.

20. *Medical School Clinical Material:*

Discussion was held on the question raised by medical school deans as to the acceptance on the basis of pathology of selected members of prepayment plans, to come into the clinical wards of teaching hospitals rather than as private patients. It was regularly moved, seconded and voted that the Council Chairman appoint a committee to meet with representatives of the medical deans to work toward a solution of this problem.

21. *"Future M.D.":*

It was regularly moved, seconded and voted that California Medicine be sent to all medical students, interns and residents if postal regulations would permit. It was also agreed to recommend to the Council that all publications of the Association be subject to final edit by the Editor (with the advice and assistance of the Editorial Board), pursuant to the provisions of Section 8 of Chapter 6 of the By-Laws.

Adjournment:

There being no further business to come before it, the meeting was adjourned at 7:00 p.m.

Donald D. Lum, M.D., *Chairman*
M. Laurence Montgomery, M.D.
Assistant Secretary-Treasurer

Postgraduate Activities in Los Angeles County

The following report was prepared by Dr. Charles A. Broaddus, California Medical Association Director of Postgraduate Activities, who plans to make further reports from time to time as information is assembled, as a means of stimulating the organization of postgraduate education programs by county societies and other local groups.

The Los Angeles County Medical Association does not have general meetings for postgraduate educational programs. The general practice section and the various specialty groups are so large that each has its own separate program.

This year an effort is being made to put special emphasis on the subject of tumor growths by having each section of the county association put on two programs devoted entirely to cancer in the field of its specialty.

In addition to the frequent meetings of all the specialty groups which keep the association's auditorium occupied every night in the week, there are other special meetings which deserve attention.

Early this year the county association put on an outstanding chest symposium for the general practice section. This was prepared by a committee under the leadership of Dr. L. C. Burwell. A registration fee of $5.00 was charged for the two-day session. The program included the following:

"The Differential Diagnosis of Cough," Dr. Daniel Myers, Wayne University Medical School.

"What to Know About Carcinoma of the Lung," Dr. Robert M. James, University of Toronto Medical School.

In addition, many subjects relative to diseases of the chest were discussed by several physicians including Drs. Gordon Meiklejohn, H. Corwin Hinshaw, Charles Edward Smith, and R. R. Newell, all of San Francisco; Rutherford T. Johnstone, Robert J. Anderson, George Griffith, Roger Egeberg, Francis Byron and Howard Bosworth of Los Angeles; and Edward Kupka of Berkeley.

A unique group in the San Fernando Branch is known as the "Doctors' Breakfast Club" which meets every Wednesday at 7:30 a.m. in the dining room of St. Joseph's Hospital. This group was organized three years ago with a membership of seven doctors led by Dr. David Lindemauer, chairman. The membership has steadily grown until now there are a hundred or more in attendance. No dues are charged. The program is arranged and printed six months in advance. Speakers are limited to 35 to 40 minutes for lecture and allowed 15 to 20 minutes for a question period. No honorarium is paid. Occasionally, as opportunity presents, a famous physician from out-of-state may be introduced or substituted for the regular speaker. In the past three years the group has met weekly without fail.

A similar group of 55 physicians has formed a "Doctors' Breakfast Club" which has been meeting weekly in the eastern part of Los Angeles County at the Murphy Memorial Hospital of Whittier. This group has grown up during the past 18 months under the leadership of Dr. Walter Wilson.

Plans are being made to form other such breakfast clubs in various part of the county.

The Research Study Club of Los Angeles is another organization successfully promoting postgraduate education. Earlier this year it completed its 19th annual clinical convention in ophthalmology and otolaryngology with an attendance of 400 from all over the United States, Canada, Hawaii and Mexico. Among the lecturers present were Dr. Conrad Berens and Dr. Raymond E. Meek of New York City and Dr. Percy E. Ireland and Dr. Joseph A. Sullivan of Toronto, Canada.

Valley Blood Bank

A vital link to the blood bank service in California has been the addition of the Valley Blood Bank of Fresno, California. Its location in the geographical center of California is an important step in connecting the growing blood bank centers already established in Southern and Northern California.

Its origin on December 1, 1948, was effected through the combined efforts of the Fresno County Medical Society and Dr. J. R. Upton, chairman of the California Medical Association Blood Banks Commission. Up to the time of the Valley Blood Bank operation, the major part of the San Joaquin Valley had been supplied with blood by the Fresno County Hospital. With the increasing demand for blood in this area, Fresno physicians and Dr. Upton realized the necessity for establishing a separately organized blood bank service. At a meeting of the Fresno County Medical Society late in 1948 positive steps in this direction were outlined. The society sanctioned the establishment of a bank to be called the Valley Blood Bank under the direction of C. D. Newel, M.D. The bank began operation on December 1, 1948.

Operating with its center in Fresno, the Valley Blood Bank has grown during its first year by serving Madera, Kings, Merced, Mariposa, and Tulare counties in addition to Fresno County. In order to provide an adequate blood supply to this total area (17,801 square miles) mobile blood drawing units were necessary. Through the cooperation of various hospital officials in the valley, a mobile drawing unit was organized, and now draws weekly at hospitals in Merced, Madera, Hanford, and Tulare. The latest addition in the growing list of hospitals to use the service of the Valley Blood Bank is the recently completed 250-bed Veterans Hospital located in Fresno.

In the first year of operation 6,000 donors gave blood; 85 per cent of it was used for whole blood transfusions and the remaining 15 per cent was dispensed through processing for plasma.

The Valley Blood Bank operates essentially as do the Sonoma, Alameda, San Mateo and Irwin Memorial blood banks. The usual maintenance service fee is charged to the patient in order to cover the cost

of drawing the blood, processing and dispensing it, and replacement is required. This basic axiom guarantees a constant supply of blood and prompt service to the numerous hospitals using the blood bank facilities.

Several valley organizations have set up credits for themselves and their families. Among these are listed:

State Highway Patrol.

Communication Workers of America.

Pacific Gas and Electric Company of the San Joaquin Valley.

Navy Club of Fresno.

The Lemoore Eagles.

Eastern Star division of Fresno and Mariposa counties.

Other groups have expressed a desire to establish credits with the Fresno bank and they will be cared for.

A favorable commentary on its effectiveness in contributing to the health of the valley community is the fact that outlying valley hospitals are actively responding to the formation of subsidiary blood bank depots. With the establishment of these emergency depots, the more isolated communities are guaranteed faster blood delivery.

In Memoriam

Ching, Marcus. Died in San Francisco, June 14, 1950, aged 38, of carcinoma of the pancreas. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1937. Licensed in California in 1938. Dr. Ching was a member of the Santa Clara County Medical Society, the California Medical Association, and the American Medical Association.

✤

Hayhurst, Wendell O. Died in Burbank, May 3, 1950, aged 40. Graduate of Baylor University College of Medicine, Houston, 1932. Licensed in California in 1936. Dr. Hayhurst was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

Myers, Glenn E. Died in Los Angeles, June 11, 1950, aged 64. Graduate of the Indiana University School of Medicine, Bloomington-Indianapolis, 1909. Licensed in California in 1916. Dr. Myers was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

Schenck, George F. Died in Los Angeles, June 5, 1950, aged 59, of a coronary. Graduate of the College of Physicians and Surgeons, Los Angeles, 1917. Licensed in California in 1917. Dr. Schenk was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

Shufelt, Alson A. Died in San Jose, June 11, 1950, aged 58, of a coronary. Graduate of the University of California Medical School, Berkeley-San Francisco, 1917. Licensed in California in 1917. Dr. Shufelt was a member of the Santa Clara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

Singer, Harry. Died in Los Angeles, June 8, 1950, aged 51, of a heart attack. Graduate of the University of Illinois College of Medicine, Chicago, 1925. Licensed in California in 1926. Dr. Singer was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

Snow, William F. Died in Bangor, Maine, June 12, 1950, aged 75. Graduate of the Cooper Medical College, San Francisco, 1900. Licensed in California in 1900. Dr. Snow was a retired member of the Santa Clara County Medical Society, and the California Medical Association.

✤

Spalding, William C. Died in Hillsboro, Texas, May 23, 1950, aged 60, from angina following a coronary. Graduate of the College of Physicians and Surgeons of Baltimore, 1915. Licensed in California in 1922. Dr. Spalding was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

Wilson, Kenneth G. Died in Laguna Beach, June 20, 1950, aged 35. Graduate of the University of Minnesota Medical School, Minneapolis, 1941. Licensed in California in 1945. Dr. Wilson was a member of the Orange County Medical Society, the California Medical Association, and the American Medical Association.

Questions and Answers about C. P. S.

If you have a question of general interest about C.P.S., please address it to the editor of CALIFORNIA MEDICINE.

Question: Until the recent introduction of the revised Billing Form 9, I have found the itemization of my payments on a small white printed form attached to my returned claim. Where do I find this information now that the new Form 9 is being used?

Answer: This small white form has been abolished for claims submitted on the new Form 9. The breakdown of payments now appears on Part 3 of the revised form. This change was made because it reduced clerical work in C.P.S. offices, thus effecting financial savings.

Question: Where several different types of services are paid on one claim, how do I determine how much has been paid for each service?

Answer: Refer to Part 3 of the new Billing Form 9 under the column headed "Proc" (for Procedure). The numbers listed there, and the payments shown opposite, correspond to procedures listed in the fee schedule.

Question: What has been the experience with regard to "catastrophic coverage," the new protection against the costs of 23 major ailments?

Answer: Benefits of the catastrophic plan were first offered to Northern California residents on February 1, 1950, and to Southern California residents on March 1. In the few months since then more than 5,000 beneficiary-members have availed themselves of this additional protection.

Thus far, only a comparative handful of claims have been paid, and the true experience of catastrophic coverage must await a considerably longer lapse of time. Meanwhile, the C.P.S. administration is progressing carefully with this new protection, and health statements are required for all applicants.

Question: Last April I received a letter from the C.P.S. Veterans' Department informing me that, due to a shortage of government funds, authorizations to treat veterans under the Home Town Care Program would be limited by the Veterans' Administration. Does this shortage of funds continue into the new Federal fiscal year which started July 1?

Answer: No. Since July 1 authorizations for treating veterans have not been limited because of a shortage of funds. A new appropriation has become available and authorizations are being issued in the usual manner.

Question: For purposes of the Veterans' Program, does the term "service-connected" mean a condition for which the veteran was hospitalized or treated during the period he served in the military forces?

Answer: No. "Service-connected" means that the veteran has been legally rated by an Adjudication Board of the Veterans Administration for a specific condition (or conditions) which was service-incurred or aggravated. According to law, the veteran is thereby entitled to treatment for that condition at government expense.

Question: If a changed condition develops in one of my veteran patients, how can I obtain approval to render the additional services which become necessary — and which were not included in my original monthly authorization?

Answer: Once you have received your monthly authorization for treating a veteran patient, authorization for additional services may be requested by telephone or letter. In an emergency, telephone the C.P.S. Veterans' Department in San Francisco, Los Angeles or San Diego. In other cases, send a letter—but do not render any of the additional services until the supplemental authorization has been received.

Question: What is the latest date I can submit my bill to C.P.S. and still receive payment the following month?

Answer: To be paid in the following month, bills should be received by C.P.S. on or before the 15th of the month. For example: June bills received by C.P.S. on or before July 15 normally are paid in the early part of August. However, if a bill does not properly identify the patient and/or the physician, or if more information is required regarding the service rendered, processing of the claim is delayed pending clarification.

Question: Can I phone C.P.S. for quick information about the benefits to which a specific C.P.S. patient is entitled?

Answer: Yes, call the Inquiry Section of the Medical Department in San Francisco or Los Angeles. Be sure to give the patient's name, membership number (and code numbers, if available), and relationship to the subscriber-member — e.g., son, daughter, wife or husband.

Question: I have had my bill returned with the following statement stamped across the front: "We cannot identify your patient as a beneficiary member of C.P.S. under the above certificate number." Does this mean the person is not a C.P.S. member?

Answer: Not necessarily. It is more likely that the member's correct C.P.S. number has not been shown on the bill. Many bills are received with incorrect numbers—and sometimes with no number.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Physicians in the Los Angeles area have been asked to notify the City Health Department by phone of possible or **suspected cases of Q fever** coming to their attention in order that the patients may be subjected to a new diagnostic test for the disease.

Studies of the new test, which may be applicable in the acute as well as in the convalescent stage of the disease, are being conducted by Dr. Joseph Victor of the U. S. Public Health Service as a part of the continuing research on Q fever in the Los Angeles area.

In addition to notifying the City Health Department, physicians are requested to obtain a specimen of blood which will be collected by the health department for complement fixation tests. The department then will contact the physician with regard to follow-up for additional blood specimens for special diagnostic studies by Dr. Victor in suitable cases.

ORANGE

Dr. Joseph Preizler has been appointed Orange County deputy health officer in charge of tuberculosis control. He succeeds Dr. Erwin P. Brauner who resigned to take appointment as health commissioner for the American zone of Berlin.

SAN FRANCISCO

Dr. Robert A. Scarborough of San Francisco was elected president-elect of the American Proctologic Society at the recent convention of that organization in Los Angeles.

* * *

Three awards totaling $55,580 for **studies of poliomyelitis** were made to the University of California by the National Foundation for Poliomyelitis in June. The largest, a grant of $41,580, was allocated for virus research under the direction of Dr. Wendell M. Stanley. A grant of $4,900 was made for support of studies on the blood brain barrier in relation to poliomyelitis under the direction of Dr. Robert B. Aird, and $9,100 was allotted for studies on treatment under the direction of Dr. LeRoy C. Abbott.

* * *

Renewal of National Cancer Institute grants to two California teaching institutions to aid in improved **training of students with regard to cancer** was approved recently by Dr. Leonard A. Scheele, surgeon general of the U. S. Public Health Service. Stanford University School of Medicine was allotted $21,958 and the University of California Dental School $4,968.

GENERAL

Applications for **American Heart Association research fellowships** and stipends for established investigators will be accepted up to September 15, 1950, according to an announcement by Dr. Howard B. Sprague, president of the association. Applications for research grants-in-aid, including grants for research in basic sciences not necessarily directly related to cardiovascular disease, may be filed up to December 15. More than $1,000,000 will be allotted this year by the American Heart Association and is affiliates, it was announced.

Fellowships for established investigators may be granted for a five-year period at a minimum stipend of $5,000, with an annual increase of $500. "They are open to superior individuals of proven originality, with the degrees of Doctor of Medicine, Doctor of Philosophy, or Doctor of Science, or equivalent degree, who are interested in making a career in research," the announcement said.

Eligible for research fellowships, which are granted for a one-year period with a stipend ranging from $3,000 to $4,300, are graduates of approved medical or graduate schools who are interested in research and intend to follow an academic career.

* * *

The American Roentgen Ray Society will hold its 50th anniversary meeting in St. Louis, September 26-29.

* * *

The International College of Surgeons, United States Chapter, will hold its 15th Annual Assembly and Convocation in Cleveland, Ohio, October 31, November 1, 2, 3, 1950. All doctors of medicine interested in surgery and its advancement are invited to attend, and can obtain a program upon request to Arnold S. Jackson, M.D., Jackson Clinic, Madison, 4, Wis.

* * *

Community blood banks in California are prepared for full cooperation with defense planning, Dr. John R. Upton, chairman of the California Medical Association's Blood Bank Commission, notified the Office of the Secretary of Defense last month. The facilities of the various community blood banks in the state was offered for use in procurement and processing of **blood for overseas shipment.**

* * *

The American Urological Association recently announced its annual award of $1,000 (first prize of $500, second prize of $300 and third prize $200) for essays on the result of some clinical or laboratory research in urology. Competition is limited to urologists who have been in such specific practice for not more than five years and to men in training to become urologists. The first prize essay will appear on the program of the forthcoming meeting of the American Urological Association, to be held at the Palmer House, Chicago, Illinois, May 21-24, 1951.

Full particulars may be obtained from the secretary of the association, Dr. Charles H. de T. Shivers, Boardwalk National Arcade Building, Atlantic City, New Jersey. Essays must be in his hands before February 10, 1951.

* * *

Two medical committees to formulate plans for use in event of **atomic or other armed attack** were named last month by Governor Earl Warren.

Appointed to a **radiological safety advisory committee** were Dr. Stafford Warren, dean of the University of California at Los Angeles School of Medicine, Dr. B. M. Brundage, atomic energy project associate at the same institution, and Dr. Andrew H. Dowdy, professor of radiology at U.C.L.A., Dr. Robert S. Stone, professor of radiology at the University of California School of Medicine, Dr. Harold Hill, a San Francisco radiologist, Dr. Justin Stein, a Los

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

SEPTEMBER 1950

University of Southern California, School of Medicine

Clinical Review of Internal Medicine—12 weeks full-time from September 11 to December 1, 1950.

Cardiology and Vascular Disease—12 months, full-time from September 11, 1950 to September, 1951.

Hematology—12 weekly, 2-hour evening lectures. Clinical application of newer diagnostic methods in cardiology. Given at Los Angeles County Hospital.

Recent Advances in Surgery, Obstetrics and Gynecology—Given in San Diego.

Electrocardiography—Given at Centinela Hospital, Inglewood.

University of California, San Francisco

Ophthalmology—September 11 through 15, 1950. Toland Hall, University of California Hospital. Address: Stacey R. Mettier, M.D., Head of Postgraduate Instruction Medical Extension, University of California Medical Center, San Francisco 22.

University of California at Los Angeles

Symposia on Therapy in Metabolic, Endocrine and Gastrointestinal Diseases—September 20 to December 13, 1950. Wednesday evenings, 8 to 10 p.m.

Surgical Anatomy—September to December, 1950.

Stanford University, School of Medicine

September 11 to 15.

Morning Courses: Monday, Tuesday, Wednesday, Thursday and Friday, 8:30 a.m. to 12 noon.

Course 1—General Surgery
Course 2—Acute Surgical Emergencies
Course 3—Surgical Anatomy
Course 4—Internal Medicine
Course 5—Electrocardiography
Course 6—Diseases of the Chest
Course 7—Pediatrics

Afternoon Courses: 1:30 to 5 p.m.

Course 8—Surgical Anatomy
Course 9—Proctology
Course 10—Fundamentals of Roentgen Diagnosis
Course 11—Fractures
Course 12—Internal Medicine
Course 13—Obstetrics and Gynecology

Address: Stanford School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

OCTOBER 1950

University of California at Los Angeles

Recent Advances in Obstetrics and Gynecology—One week.

NOVEMBER - DECEMBER 1950

University of California at Los Angeles

Ophthalmology.

DECEMBER 1950

University of California at Los Angeles

Internal Medicine—9 months full-time, December 4, 1950 to September 1951.

JANUARY 1951

University of California at Los Angeles

Advanced Hematology—Eight lectures.

* * *

TWO-DAY MEDICAL INSTITUTES, sponsored by the COMMITTEE ON POSTGRADUATE ACTIVITIES and by the local county society in each locality (exact dates to be announced later).

Santa Barbara in October 1950.
Fresno in November 1950.
Riverside in January 1951.
Santa Rosa in February 1951.
Sacramento in March 1951.

Angeles radiologist, Dr. John H. Lawrence, University of California associate professor of medicine and medical physics, and Dr. Phillip Condit of the State Health Department.

Physicians named to a **medical advisory committee** were Dr. Edward S. Rogers of Berkeley; Drs. Walter E. Macpherson, Harold Pearson, Justin J. Stein, George M. Uhl, and Richard M. Brundage, all of Los Angeles; Drs. Alonzo F. Brand, Earl R. Miller, and Rodney Beard, Adm. J. P. Owen, M.C., U.S.N. (Ret.), and Col. Kermit H. Gates, M.C., U.S.A., all of San Francisco; and Col. Paul C. Gilliland, M.C., 4th A.F., Hamilton Field.

* * *

A 16 mm. motion picture in color on **arthritis and rheumatism** is being made by the Arthritis and Rheumatism Foundation for showing at meetings of county medical societies and other medical groups. Produced under the supervision of the foundation's Medical and Scientific Committee, the film is scheduled for completion about September 1, 1950, and prints then will be available for loan to interested groups. There will be no charge save to cover shipping costs. In some areas, arrangements can be made through the foundation for medical speakers to address audiences at a showing of the film.

The film will review the incidence of the diseases, the economic and social significance of them, the lack of facilities for care of patients, and the small sums available for medical research, according to the foundation's announcement. Case histories in which cortisone and ACTH are used in treatment "will stress the fundamental importance of hormone therapy as a guide to fuller understanding of the disease processes in rheumatoid arthritis and gout."

Arrangements for borrowing the new film may be made through the secretary of the foundation, Dr. Charles Ragan, Presbyterian Hospital, New York 32, N. Y.

INFORMATION

Medical Technicians: The Present Need and Training in California

JAMES HOPPER, JR., M.D., and RAMONA GREEFKENS, *San Francisco*

THOSE individuals concerned with enlisting the services of medical technicians may have experienced considerable difficulty from time to time. This problem was present at the University of California Hospital throughout the war years and the situation has not been eased since. Adequately trained medical technicians continue to be scarce.

Conscious of the role that the state university should play in supporting and aiding the training of technicians, the faculty has reorganized and enlarged the medical technicians' curriculum (see Appendix I). However, it has been found that students eligible for our course are few in number. This has prompted investigation of the causes for the apparent shortages. With the aid of the Division of Laboratories of the State Department of Public Health, a survey was made to give an index of the need throughout the state for licensed medical technicians. Although made only by the simple expedient of a card questionnaire, the survey revealed facts which should be of interest to physicians, medical technicians, and others concerned.

On April 14, 1948, questionnaires were sent to 600 directors of laboratories in the state of California. Of the 340 answers received, 141 were from hospital laboratories and 199 from non-hospital clinical laboratories. The following is a summary of the questions and answers:

1. Q: How many positions in your laboratory require licensed technicians?
   A. 1,056 technicians were needed in the 340 laboratories.
2. Q: How many current vacancies have you?
   A: 153 vacancies in the 340 laboratories. (A shortage of 14.5 per cent.)
3. Q: What is your average yearly turnover of technicians?
   A: Approximately one-third of the total number of technicians employed.
4. Q: Are licensed technicians easily obtained?

A: *No*	*Yes*	*No Answer*
269 (79%)	49 (14%)	22 (7%)

5. Q: What is the quality of the technicians available?

A: *No. of Laboratories*	*Answer*
15	Excellent
75	Good
113	Fair
47	Poor
16	No technicians available
74	No answer

6. Q: Do you think that the state licensing requirements are excessive?

A: *No*	*Yes*	*Inadequate*	*No Answer*
263 (77%)	59 (17%)	3 (1%)	15 (5%)

This survey confirms the impression that there are not enough technicians available to fulfill the present needs in California. In the 340 laboratories there is a 14.5 per cent deficit of technicians. Secondly, the general quality of technicians appears to be only fair. Accordingly, most laboratory directors (77 per cent) do not think that the state license requirements are excessive; a small minority think they are inadequate. The rate of turnover in employment is extremely high. This may depend upon the fact that most medical technicians are marriageable women who are likely to give up their professional careers for marriage.

The following are some of the reasons which appear to be potent deterrents to the choice of medical technology as a career:

The appendix reveals that in order to take the California State Clinical Laboratory Technicians' Examination for licensure, it is necessary to have a college degree, or at least to have spent five years as a technician or apprentice in a laboratory approved by the state. Few laboratories are willing to give a five-year apprenticeship since the cost to themselves is likely to be excessive; they prefer to start with a college-trained novice. Such preparation should entitle the candidate to a good income. Yet, when one compares the economic status of medical technicians with that of other groups, it is immediately apparent that they are relatively low in the economic scale. Recent surveys* showed that a janitor gets from $36.40 to $57.67 for a 40-hour week, while a medical technician gets from $55.81 to $67.44 for a 40-hour week.† Whereas this salary may suffice for a single woman, it does not appeal to the average man who desires to raise a family. It is apparent that although educational requirements of technicians have steadily risen, their relative economic status has remained the same. Available records show that in 1936 medical technicians began at $85.00 a month, and that technicians who had seven years' experience were getting a salary of $105.00

From the Division of Medicine, University of California School of Medicine, San Francisco, California.

Administrator of Medical Technicians' Curriculum (Hopper); Supervisor of Medical Technicians' Curriculum (Greefkens).

*State of California, Department of Industrial Relations, Division of Labor Statistics.

†A weekly salary of $55.81 is paid to one who has had four years of college and one year of hospital apprenticeship, plus two years of practical experience. The top salary implies four to six years' additional practical experience.

a month, salary ranges which then, as now, compare to compensation for janitorial work.

It would seem that it is not alone insufficient remuneration which has led to the present dearth of technicians. Among other causes may be listed:

1. The lack of organized training programs or schools for the training of technicians. At present the Council on Medical Education and Hospitals of the American Medical Association lists only eight approved schools for apprenticeship training in California. These eight schools can accommodate only 64 students a year.

2. The failure on the part of organized groups (such as physicians and technicians through their societies, etc.) to create interest in the field, and to attract students. The field of medical technology is to be contrasted with that of nursing, in which (a) the Nurses Association sponsors a program creating interest in this field; (b) student nurses are subsidized during their training period in an amount sufficient for about three-fourths of their entire living expenses.

3. The fact that scientific development has created a need far outstripping the supply, a need which promises to grow as we advance into the age of increasing applied sciences.

4. The number of physicians in this state has approximately doubled in the past eight years, and the patient population has greatly increased.

It is hoped that the foregoing survey and comments, although incomplete, will serve to stimulate action by county medical societies and technician societies, favoring the lot of the student medical technician group. Physicians specializing in pathology particularly appear remiss in affording apprenticeship training to students qualified by appropriate university training to become technicians. Further, it is fair to point out that hospital administrators can expect a continued shortage of properly qualified technicians in the laboratories under their supervision, unless they fulfill their obligation by offering apprenticeships for student technicians. Since physicians are so dependent on technicians, the facts here disclosed should be a challenge to them to support any program which will increase the availability of competent technicians.

APPENDIX

I. *Requirements for Admission to the Medical Technicians' Curriculum, University of California Medical School:*

At least three years of college work, including Biochemistry 101 and Bacteriology 101, or the equivalent of these courses.* Preference is given to applicants who hold a degree of A.B. or B.S. with a major in one of the biological sciences, and who have completed the prescribed courses stated above.

II. *Requirements for Entrance into the Examination for California State Licensure:*

(a) Completion of a regulation four-year college curriculum in medical or clinical laboratory technique with a degree of A.B. or B.S. in a college or university approved by the department (State Department of Public Health), the last year of which course shall have been primarily clinical laboratory procedure; provided, however, that if the curriculum did not include practical clinical laboratory work, six months of apprenticeship in a clinical laboratory approved by the department shall be required; or

(b) Graduation from college with a degree of A.B. or B.S. and a major in bacteriology, biochemistry, or essentially equivalent subject or subjects as may be determined by the department, plus one year of apprenticeship training in a clinical laboratory approved by the department. A year of apprenticeship training in a public health laboratory may be accepted if the apprenticeship or university course included practical work in clinical biochemistry and hematology; or

(c) A minimum of five years' experience as a technician or apprentice doing clinical laboratory work embracing the various fields of clinical laboratory activity in a clinical laboratory approved by the department, except that university work which includes courses in the fundamental sciences may be substituted to a maximum of four years for such experience in the ratio of 30 semester hours for each year of experience.

III. *Requirements for Admittance to the Examination of the Registry of the American Society of Clinical Pathologists:*†

At least two years of college work, including the following curriculum:

Biology: 12 semester hours, of which 4 semester hours must be zoology.

Chemistry: General inorganic: 8 semester hours. including 4 semester hours of laboratory. Quantitative analysis: 4 semester hours, with not less than 1 semester hour of laboratory.

Electives: Sufficient to give a total of 60 semester hours of college credit, *plus* at least 12 consecutive months in a school of medical technology approved by the Council on Medical Education and Hospitals of the American Medical Association.

IV. *Medical Technicians' Curriculum — University of California Medical School:*

The University of California Medical School offers a training program to students preparing to be

*Note, however, that the State of California requires either an A.B. or B.S. degree in order for the applicant to be eligible to take the state examination, thereby making it possible to gain a license to practice medical technology. Accordingly, unless the college attended by the student is willing to allow credit toward the A.B. or B.S. degree for the practical year spent in the University of California Medical School course, it is necessary to obtain a degree prior to taking the course.

†It will be noted that the California State requirements and those of the University of California Medical School are distinctly higher than those of the Registry of Medical Technologists; consequently, if one is prepared to take the State examination, he is also eligible for the Registry examination.

medical technicians. The curriculum is given in the form of a practical rotating apprenticeship, which is one year in length, and covers training in medical bacteriology, biochemistry, clinical pathology, serology, blood bank procedures, parasitology, mycology, histological technique, basal metabolism and electrocardiography. This course is offered under the supervision of the administrator of the medical technicians' curriculum of the School of Medicine; the laboratory work performed by the students is under the guidance of the graduate technicians and certain faculty members of the Medical School. The students are assigned for allotted periods to the various clinical and teaching laboratories of the Medical School and associated institutions.

Upon satisfactory completion of the course, the student receives a certificate in laboratory technique, and is eligible for the National Registry Examination. If the student holds a degree of A.B. or B.S., he is eligible for the California State Examination.

Practices of Life Insurance Companies in Payment of Medical Fees for Examinations*

In November of 1949 a letter was addressed to all insurance companies licensed to write life insurance in the state of Wisconsin, directing their attention to the desirability of examining their fee schedules for the payment of medical services rendered in the examination of persons applying for life insurance. This communication was directed to insurance companies at the suggestion of the Bureau of Economic Research of the American Medical Association, which organization had been urging insurance companies to revise their fee schedules in line with increased living and business costs of physicians rendering this service to insurance companies.

On the basis of the many replies received to the initial communication it was apparent that many companies had revised their fee schedules within recent years, or were considering such revisions in line with the suggestion made by the American Medical Association and the State Medical Society of Wisconsin. To what extent such revisions had been made, and a comparative picture of prevailing practices among the leading insurance companies doing business in Wisconsin, was not apparent from the replies received, and it was suggested that a more detailed study be made, so as to provide a better understanding of prevailing practices, and to determine to what extent basic changes had been made in fee schedules during the past 20 years.

As a result of this request a second communication was sent to all 52 insurance companies licensed to write life insurance in Wisconsin, with a brief questionnaire attached. The content of this questionnaire was suggested by Dr. Nels Hill, Madison, who has had wide experience with the content of insurance examinations.

On the following pages are given some summary statistics which will serve to provide a better understanding of prevailing fees charged for the more basic medical services rendered life insurance companies.

*A study made for the Interim Committee of the Council of the State Medical Society of Wisconsin during January and February 1950.

In reviewing this material it must be recognized that the statistics are not as complete as would be the case in a longer and more detailed study. In many instances the company reporting indicated that fees varied within stated or unstated ranges, depending upon the amount of information required of the company, or the various types of forms used. Thus, there is a variation of practices which could not be completely reflected in the brief summary prepared. However, some general basic principles can be attained from even so elementary a study as was carried on.

1. *There have been many increases in fees.* In many cases these increases have been rather small, but it is obvious that many of the insurance companies have recognized the justice of paying more for the services rendered in 1950 than the rendition of the same services in 1940 and 1930.

2. *Varying risks, varying fees:* While most companies report a basic fee for an average examination the larger risks necessitate special examinations which are reflected in more complicated and complete medical services, which in turn are reflected in higher fees.

3. *Trend towards "fees as billed":* While the simple procedures have rather set fees, the special services are increasingly billed on the basis of service rendered, and are not restricted at a set fee. There is often range, but more frequently the determination of the fee charged is left up to the physician rendering the service. This is particularly true in services involving chest x-rays, electrocardiograms and fluoroscopic examinations.

4. *Lower fees for Wisconsin companies:* Generally speaking, the Wisconsin companies do not pay as high fees as do the companies with offices outside of the state. Several of the Wisconsin companies have indicated that they were considering a marked revision of their present fee schedules, which might bring them in line with the companies with home offices outside of the state.

The summary given below covers the reports of 39 out of 52 insurance companies. With few excep-

tions the companies not reporting are small in their operation of life insurance departments, so the reports of the 39 companies responding to the request for information present a very satisfactory basis for comparison.

1. *Regular Medical Examination*

39 companies reporting

Present Fees:

Range $3 to $7.50

1—$3 (Wisconsin State Life Fund. Rate set by law.)
24—$5
14—$7.50

Eight companies report varying fee according to extent of risk. Most of those reporting varying fees give up to $10 on special risks. Fourteen companies report increase from $5 to $7.50 since 1930 or 1940.

* * *

2. *Medical Examinations Plus Heart Report*

35 companies reporting

Present Fees:

Range from $5 to $13

1—$5	4—$9
1—$6	4—$10.50
10—$7	1—$11.50
4—$7.50	1—$13
9—$8	

In most instances $2 to $3 is added to the fee for a regular examination if special heart form required. Several companies report varying fee for special policies over $25.000. Twenty-one companies report some increase in fees for heart reports since 1930 and 1940. In prior periods, in many instances this service was considered as part of the regular examination, without additional remuneration.

* * *

3. *Additional Fee for Urinalysis*

36 companies reporting

Present Fees:

Range from $1 to $3

13—$1 }
20—$2 } In all instances, only securing of specimen. Analysis made at home office.
3—$3 }

Eight companies report increase since 1930-40. Increase in all instances an additional dollar.

* * *

4. *Postage for Mailing of Specimens*

36 companies reporting

Present Fees:

29—Postage paid by company or refunded to physician.
7—No postage paid.

Of the companies paying postage, five report that in 1930 or 1940 such expense was borne by the physician.

* * *

5. *Juvenile Examinations*

32 companies reporting

Present Fees:

Range from $2 to $10

2—$2	9—$5*
3—$2.50	1—$7.50*
15—$3	1—$10*
1—$4	

Ten companies report an increase in fees from 1930 and 1940.

*Several report higher fee for combination of juvenile and payor examinations. While not indicated on the reports, the fees in excess of $4 are probably a combination of juvenile and payor examinations.

6. *Payor Examinations*

29 companies reporting

Present Fees:

Range from $2 to $7.50

1—$2	3—$4
1—$2.50	12—$5
7—$3	4—$7.50
1—$3.50	

As in juvenile examinations, many quoted fees above $3 are for combinations of juvenile and payor examinations. Seven companies now having an established fee for payor examinations did not have in 1930 and 1940. Nine companies that did have established fees for payor examinations in 1940 have since that time increased their fees.

* * *

7. *Family Physician Blanks*

34 companies reporting

Present Fees:

Range from $1 to "fee as requested"

1—$1
18—$2 (or from $2 to $3)
11—$3 (or from $3 to $5)
4—"as billed"

Several companies report varying fees, either based on (1) length of report required, (2) larger fee for large clinics such as Mayo's. Seventeen companies report increase over fees paid in 1930 and 1940 (increases usually $1).

* * *

8. *Glucose Tolerance Tests (Urine Only)*

13 companies reporting fees by specific amounts
5 companies reporting fees "as billed"
16 companies reporting "not used"

Present Fees:

Range from $2 to "as billed by laboratory"

4—$2
1—$2.50
5—$3
1—$5
1—$7.50
1—$10 (if lab. work done by M.D.)
5—"as billed"

Two companies report increase ($1) in fee over fee paid in 1940. There is a tendency to drop this from fee schedules by several of the companies reporting.

* * *

9. *Glucose Tolerance Tests (With blood sugar determination)*

26 companies reporting specific fees
9 companies reporting fees "as billed by laboratory"

Present Fees:

Range from $5 to $15

The fees above $7.50 are generally determined on the number of leads requested and furnished. The lower fees are generally for collecting sample only (laboratory work done in the home office).

9—$5 (for collecting)
2—$7 (for collecting)
1—$7.50 (for collecting)
1—$8
11—$10
1—$12
1—$15
9—fees "as billed by laboratory"

Six companies report an increase in fees since 1930 and 1940. Trend seems to be away from fee for laboratory analysis and payment of $5 to $7.50 for collection of sample, which is then analyzed in home office laboratory or in a laboratory designated by the company.

10. *Electrocardiogram*

35 companies reporting
24 companies reporting specific fees
11 companies reporting "fee as billed"

Present Fees:

Range from $5 to $15

Many reports have ranges, with fees determined on whether direct or chest, or a combination. Higher fees also involve interpretation. (One company reports, "We pay up to $30 for specialized examinations on large risks, including chest x-ray."

3—$5 "and up"
10—$7.50 "and up" (generally up to $10)
11—$10 "and up" (generally up to $15)
11—"fee as billed"

Fourteen companies report an increase in fees over 1930 and 1940. In most instances the increase has been in a recognition of varying fees for varying services. Generally the increase has been between $3 and $7.50 over fees paid in 1940.

* * *

11. *Chest X-rays*

35 companies reporting
23 companies reporting specific fees
12 companies reporting "fee as requested"

Present Fees:

Range from $5 to $15

3—$5 "and up"—range up to $15
18—$10
2—$10 to $15
12—"fee as requested"

Four companies report an increase in fees over 1930 and 1940. In most instances the increase has been in recognition of varying fees for varying service. The most common fee in 1940 as in 1950 was $10.

* * *

12. *Fluoroscopic Examinations and Orthodiagram*

33 companies reporting
11 companies reporting specific fee
11 companies reporting "fee as requested"
1 company reporting "fee varies"
10 companies reporting "never requested"

Present Fees:

Range from $5 to $15

3—$5
1—$5 to $10
5—$10
1—$10 and up
1—$15

For this service there have been two companies reporting specific fees which indicate an increase in rates over fees paid in 1940. Trend seems to be to have fee set by physician or laboratory rendering the service. There were more companies reporting non-use of this service than any other procedure listed.

BOOK REVIEWS

TEXTBOOK OF PEDIATRICS. Edited by Waldo E. Nelson, M.D., Professor of Pediatrics, Temple University School of Medicine, with the collaboration of 63 contributors. Fifth edition with 426 illustrations, 19 in color. W. B. Saunders Company, Philadelphia, 1950. $12.50.

The fifth edition of Mitchell and Nelson's "Textbook of Pediatrics" represents a thorough going-over and perfecting of the widely accepted fourth edition. Each chapter has been thoroughly revised and rewritten and many new chapters have been added. Improvements worthy of mention which are in keeping with the need for background knowledge in the care of children are the chapters on "Growth and Development" and "Mental and Emotional Development." These chapters have been thoroughly rewritten and enlarged upon, providing a most excellent orientation to the "pediatric way of thinking" in the application of medical knowledge to infants and children.

Of particular interest is the handling of the chapters "Disturbances of Fluid and Electrolyte Equilibrium" and "Parenteral Fluid Therapy." These subjects, always difficult to present clearly, have been presented in a brief, concise, and practical manner. The student as well as the practitioner can find a quick qualitative and quantitative answer to diagnostic and therapeutic problems in acid-base and dehydration disorders.

In an effort to make the textbook eminently practical, each author, in addition to the didactic dissertation of the specific disease, has presented clear-cut therapeutic programs for the handling of the specific disease. The quality of the text was present in the first three editions under the editorship of Griffith and Mitchell and has been successfully maintained and improved upon by Nelson. Finally, of great value is the presence of an appendix which provides ready reference to normal blood and urine values in infants and children of various ages. Included are normal cerebrospinal fluid values; water, salt, and nutritional requirements for infants and children; food value tables; methods of diet calculation, nomograms for surface area, height and weight; and a variety of conversion tables always necessary to the busy student and practitioner with a limited library at hand.

In the fifth edition of the Mitchell and Nelson "Textbook of Pediatrics" it is apparent that every effort has been made to provide a most up-to-date, complete, and practical textbook of medicine as it relates to infants and children. It should have no difficulty in maintaining its position as an outstanding textbook of medicine, and will be of value not only to the student and pediatrician but to others in all fields of medicine.

* * *

THE ARTHROPATHIES — A Handbook of Roentgen Diagnosis. By Alfred A. DeLorimer, M.D., Radiologist, St. Francis Hospital, San Francisco, formerly Commandant, the Army School of Roentgenology. Second edition. The Year Book Publishers, Inc., 200 East Orange Street, Chicago. 1949. $7.00.

This second edition of this book, one of a series of monographs on roentgenological topics, has been augmented with more written material. Several new illustrations are used, and the system of marking indicators has been clarified. The book is in three major parts: The peripheral joints, the spine, and temporomandibular joints. Emphasis is placed on the appearance of the soft tissues as well as the bones, for soft tissues often show earlier manifestations of the disease. Common technical errors are discussed, and the value of high KV technique is argued. Considerable material which is primarily bone disease is discussed because of associated joint involvement. The book is organized to make ready reference easy. Despite the small size of the book, its cuts are satisfactory, and this volume is one which should prove of interest and value to all radiologists and others interested in joint disease. Dr. DeLorimer has threaded his way through the maze of different joint diseases in a clear and succinct manner.

* * *

MEDICAL DISEASES OF THE KIDNEY (An Atlas and Introduction). By J. F. A. McManus, M.D., Associate Professor of Pathology, the Medical College of Alabama, Birmingham. Lea & Febiger, Philadelphia, 1950. $6.00.

The backbone of this small book consists of one hundred large illustrations of renal lesions, virtually all of them photomicrographs and most of them showing details of kidney tissue as stained by the periodic acid—Schiff's reagent technique. The illustrations are beautiful, revealing structure never before seen by at least one reader. It is perhaps not the fault of the stimulating text that its quality is not quite up to that of the illustrative material. One hopes the typographical errors will be corrected in later editions. The work is highly recommended specifically to all who are interested in renal lesions and to all thoughtful physicians.

* * *

CLINICAL NEUROLOGY. By Bernard J. Alpers, M.D., Sc.D. (Med.), Professor of Neurology, Jefferson Medical College, Philadelphia. 240 Illustrations. Second Edition. F. A. Davis Company, Philadelphia, 1949. $9.50.

The second edition of this textbook of neurology presents few departures from the original, but in general has been adequately brought up to date in a field that is evolving a more dynamic concept in recent years.

The book is rather more complete than the usual text, and may be considered rather voluminous for the medical student not contemplating specialization in neurology. However, the section devoted to examination of the nervous system is very good, and for this reason the book is especially valuable to the student. Equally, it is sufficiently complete to serve as a reference work adequate to the practititioner who, although not a specialist, needs to treat patients with neurological disease.

The form of presentation used is simple and direct. There is perhaps a tendency for dogmatic statements in fields in which some controversy remains, but this is not a serious disadvantage to the student, and allowances may be made for it by the neurologist. The work is probably as good a single volume text on neurology as is at present available.

* * *

METHODS IN MEDICAL RESEARCH—Volume 2. By J. H. Comroe, Jr., M.D., Editor-in-Chief. The Year Book Publishers, Inc., 200 East Illinois Street, Chicago, Illinois. 1950. $6.50.

The first volume in this series was reviewed favorably, even enthusiastically, in CALIFORNIA MEDICINE. The present volume is up to the high standard set by the earlier one.

The first of the three sections in this book deals with methods of study of the bacterial viruses (the bacteriophages) for 73 pages. The next section devotes 170 pages to pulmonary function tests (the topics include measurements upon respired gases, measurements on arterial blood, and specific tests of pulmonary function). The third section (97 pages) deals with the assay of certain hormone secretions, with particular reference to anterior pituitary hor-

mones, ovarian hormones, and testicular and adrenal hormones.

As in the first volume, each subdivision is written by an authority and is reviewed and commented upon by others. Methods are presented in great detail, and there are adequate bibliographies, author index and subject index.

The book is recommended to all medical libraries and to those interested in the study of disease, particularly to microbiologists, gynecologists and other endocrinologists, and to those concerned with pulmonary function.

* * *

AETIOS OF AMIDA—The Gynaecology and Obstetrics of the VIth Century A.D. Translated by James V. Ricci, A.B., M.D. The Blakiston Company, Philadelphia, 1950.

Aetios of Amida was a wise man, for he collected all that was known of the medical treatments of his time. He knew of strange remedies and powerful magic. He must have practiced the art of healing with skill and success, for he rose to the position of court physician to the first Justinian, the greatest of the emperors of Byzantium. Aetios was more than a mere healer, he also was a great and astute recorder of the accumulated knowledge of his period. This he set down in the 16 volumes of the Tetrabiblon, which from 600 to 1600 A.D. remained one of the few great medical encyclopedias of the old world. The last volume was devoted exclusively to the treatment of women. The indefatigable Dr. Ricci considered it important enough for posterity to rescue old Aetios' recommendations for the entertainment of his colleagues, perhaps with tongue in cheek, because now as then fact and fancy so often become entangled in the practice of gynecology and obstetrics. If you do not believe it, just have a look at what old Aetios had to say about the treatment of sterility.

Book reviews come at a dime a dozen and most of them are never read by the busy doctor. But if you are one of those who prove the exception to the rule, take my word for what I have to say about Ricci's sincere effort to open the past to you, even if for no other reason than to stimulate your imagination. As far as the humble opinion of your reviewer is concerned, Ricci has succeeded admirably in doing just that with his translation of Aetios' admonitions. Like some of the other historical contributions from the pen of James V. Ricci, this book is dressed in meticulous English and embellished with a multitude of annotations and comments. The author has been fair with the original text and whenever there was more than one meaning to a statement he kept the translation as literal as possible after consulting other experts of the lingua Latina. There is nothing in this book that is of practical value to the physician of today, but the philosophical implications and deductions incidental to medical recommendations are priceless gems of pristine thinking.

Students of history, teachers and thinkers will enjoy this book. It is a storehouse of ancient thought and of some profound wisdom, but it also is an important historical document of the evolution of medical practice. There are 123 chapters in the 16th volume of the Tetrabiblon, but the translator has managed to set them down in readable English in only 120 pages. For those who like to browse through source references and extracts from the original text, Ricci supplies 100 pages of interesting annotations. Arturo Castiglione, professor of gynecology at the University of Milan, Italy, has written a fitting introduction. The Blakiston Company of Philadelphia presents the little tome to the profession in an attractive binding. The translator has used the Latin edition of Coronarius published in Basle, Switzerland, in 1542 by Froben as the original source for his latest contribution to the history of gynecology and obstetrics. Your reviewer considers "Aetios of Amida" a worthy addition to your shelf of books to be read during leisure hours.

SPEECH THERAPY FOR THE PHYSICALLY HANDICAPPED. By Sara Stinchfield Hawk. Stanford University Press, Stanford, California. 1950. $4.00.

This book is of special value for speech therapists and fills a gap for every physician who treats spastic children. Speech therapy has been part of the treatment given to handicapped children at the Orthopaedic Hospital in Los Angeles for several decades. The author describes procedures and results in 53 cases during an eight-year period. From the clinic of the hospital, 9 per cent of the patients had speech defects (against 2 per cent of normal school children). The other therapeutic procedures, including braces and physiotherapy, were used in coordination with speech treatment.

The book contains a wealth of exercises for relaxation, practice words and sentences, articulatory exercises and verses for speech training of spastics. The occurrence of stuttering is high among handicapped children as result of poor adjustment. Therapeutic procedures and rules of mental hygiene are well outlined.

In 49 per cent the author found pure left-handedness or mixed left and right-handedness which in her opinion accounts for inabilities in speaking, reading, spelling and writing as well as for clumsiness. The I.Q. improves, often fast, under speech training. Dental factors in spastics due to malocclusion or "side-bite" from stronger pull exerted by the facial and neck muscles on the uninjured side cause need for corrective dentistry and speech training.

An interesting chapter is added on personality measurements and vocational guidance for handicapped children. I. Q. tests are difficult to apply; verbal expression is handicapped by speech difficulties, performance tests by manual incoordination. The description of combined methods will be of great practical help.

* * *

HANDBOOK OF OBSTETRICS AND DIAGNOSTIC GYNECOLOGY. By Leo Doyle, M.S., M.D. Illustrations by Ralph Sweet. First Edition. University Medical Publishers. P.O. 761, Palo Alto. 1950. $2.00.

Dr. Leo Doyle's "Handbook of Obstetrics and Diagnostic Gynecology" is a concise outline of these fields of medicine. The author states that his book is neither a textbook nor a reference book; rather, the information is outlined so that it is easily and quickly available to the busy practitioner. It is planned that the handbook will undergo frequent revisions to keep pace with the inevitable changes of therapeutics. Descriptions of surgical techniques have been omitted.

The book is divided into two sections. The first section on obstetrics includes the essentials of diagnosis and treatment of normal and abnormal pregnancy. The Rh factor is presented in a manner by which the physician can readily grasp the intricacies of this puzzling problem. There is an excellent discussion of the emotional aspects of pregnancy—a facet of patient care which has had increasing emphasis in the literature in recent months. A chapter is included on minor problems of pregngancy; the vexing nausea and vomiting, hemorrhoids, constipation and others with to-the-point methods of treatment which will be welcomed by obstetricians.

The section of diagnostic gynecology is rather short and does not cover the material as thoroughly as the obstetrical section. The diagnosis of pelvic masses and infertility management are well presented.

The diagrams and illustrations throughout the book are adequate to augment the accompanying text.

There is an excellent table of normal blood chemistry and urine values and the variations occurring in pregnancy on the cover pages, which is an added bonus of this very worthwhile book. Dr. Doyle's handbook will be a welcome addition to the libraries of general practitioners who have particular interest in obstetrics and gynecology.

BEDSIDE DIAGNOSIS. By Charles Mackay Seward, M.D., F.R.C.P. (Edin.). The William and Wilkins Company, Baltimore, 1949. $3.50.

This little book has been written to provide an analytical and systematic aid in the process of differential diagnosis. The author bases his text on the concept of disease as a disturbance of function, which may or may not be accompanied by structural change. He emphasizes that the causes of diseases are often indicated by the grouping and the method of development of symptoms and signs. His approach and discussions are very rational, viewing the patient as a whole and not as a number of separate compartments.

There are 22 chapters, each taking one of the common dominant symptoms of disease as a nucleus for discussion.

The reviewer finds fault with certain omissions and statistics. The common and important symptom of coma deserves consideration as a chapter heading. And, although the author usually accents the role of functional disorders, he quotes such conditions as being responsible for only 28 per cent of pain in the epigastrium (p. 61), whereas peptic ulcer is responsible for 59 per cent of gastric symptoms in hospital patients (p. 71). These percentages certainly seem weighted.

In general, however, this is an excellent book. It is recommended primarily as a teaching guide but can be of considerable service as a quick reference for the practitioner's diagnostic problem.

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EXHIBITIONISM. By N. K. Rickles, B.S., M.D., Fellow of the American Psychiatric Association, Diplomate of the American Board of Psychiatry and Neurology, Senior Consultant at the Veterans Administration Center, Los Angeles, Consultant in Psychiatry to the Office of the Surgeon General, Medical Department, United States Army, and Director of the Psychiatric Center of Seattle. J. B. Lippincott Company, Philadelphia, 1950. $5.00.

In the introduction, the author states, "This is not intended to be, in any sense, the final or definitive treatment of the subject." With this the reviewer can agree, since reading the book leaves one with no very clear idea of the genesis of exhibitionism or its treatment.

The author's thesis is that exhibitionism in the male is a normal primitive phenomenon which has been banned by the process of civilization. The repression of this urge, which is accomplished by most individuals before adulthood is reached, fails in the exhibitionist, and the reason for this failure is traced to revolt against a dominating mother.

The whole approach to the problem is from the psychoanalytical viewpoint and would not be acceptable to all psychiatrists not so trained. The idea that exhibitionists are suffering from mental illness and should receive psychiatric treatment we can certainly not quarrel with, although the low yield of therapeutic results can be seen from the account of some of the author's cases contained in the appendix.

* * *

MEDICAL GYNECOLOGY. By James C. Janney, M.D., Associate Professor of Gynecology, Boston University School of Medicine, Associate Visiting Gynecologist, Massachusetts Memorial Hospitals — Second Edition — Illustrated. W. B. Saunders Company, Philadelphia, 1950. $6.50.

Your reviewer has often wondered why there should be a division between medical and surgical gynecology since the two are inseparable and must be taught as a unit of general medicine. Most of the books labelled "Medical Gynecology" do not stick to their purpose but devote considerable space to surgical procedures without presenting adequate details. Janney's "Medical Gynecology" is no exception. As the author says himself, the book is the result of a series of lectures for medical students and your reviewer comes away with the feeling that no other merit is attached to this book, although it is meant "to be a refresher for the general practitioner to bring him up to date on the newer developments in the field." Your reviewer has looked diligently through the subject matter and admits reluctantly that he found little that could not be read more profitably in any standard textbook or even in the much maligned but very handy little compends called "Office Gynecology." What a pity that the author did not purge his brain-child of many archaic notions before presenting it again to the medical public in a made-over dress. For example, who ever would agree with the statement that cervicitis is a common source of bleeding and that astringent tampons are beneficial in treating the relaxed outlet? Your reviewer's strictly personal reaction to Janney's "Medical Gynecology" is that it has little to offer that is not treated more adequately and authoritatively in any of the well known gynecologic texts.

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RECENT ADVANCES IN CHEMOTHERAPY. By G. M. Findlay, C.B.E., Sc.D., M.D., F.R.C.P., Editor, Abstracts of World Medicine and Abstracts of World Surgery, Gynaecology and Obstetrics, British Medical Association. Third Edition. The Blakiston Company, Philadelphia, 1950. $7.50.

This volume is by far the best and most comprehensive review of chemotherapy of parasitic diseases that has appeared thus far. Unfortunately, the advances in chemotherapy have been so extensive that it is not possible to review them all in a single volume. Thus, the third edition of Findlay's "Recent Advances" is Volume I of a four-volume series. It contains the chemotherapy of scabies and of helminthic and protozoal diseases with the exception of malaria.

The author has covered the world literature in an amazingly precise fashion. Since the volume is well indexed and contains most of the pertinent references in the fields of chemotherapy covered, it is possible for the physician and student to consult original sources. Most important is the presentation of a more balanced view toward the role of chemotherapy and the exposition of the development of drug resistance by parasites which are pathogenic for man.

* * *

THE PHYSIOLOGIC BASIS OF MEDICAL PRACTICE —A Text in Applied Physiology. By Charles Herbert Best, C.B.E., M.A., M.D., D.Sc.(Lond.), Professor and Head of Department of Physiology, University of Toronto; and Norman Burke Taylor, V.D., M.D., F.R.S.(Canada), F.R.C.S.(Edin.), M.R.C.S.(Eng.), L.R.C.P.(Lond.), Professor in the History of Medicine and Medical Literature, University of Western Ontario. Fifth Edition. The Williams and Wilkins Company, Baltimore, 1950. $11.00.

Since its first edition appeared in 1937, this book has been regarded much as a "medical bible," and it remains so today. In this, its fifth edition, it still gives more information about the physiological basis of medical practice than any other book—even though it appears less oracular in 1950 than it did in 1937.

This edition has had fairly extensive revision, done for the most part by Dr. Taylor, but a considerable part of the material of earlier editions has been retained. This gives rise to a certain amount of unevenness in the text. The ratio of misspelled words is fairly high (for example, on page 658 the word metabolism is misspelled in the heading for chapter 50).

It is still highly recommended to all students of medicine, including the practicing physician who wishes a clearer understanding of the basic facts involved in his practice.

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The Surgical Treatment of Portal Hypertension

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SUMMARY

Portacaval shunt operations were done in 15 of 18 patients who were treated surgically for portal hypertension. In eight cases the shunt was established by splenorenal anastomosis; in seven by anastomosis of the portal vein to the side of the inferior vena cava. Of the eight patients with splenorenal shunt, two are well, four are considered improved, and two have died. Of the seven in whom the portal vein was joined to the vena cava, two are improved, one is unimproved, and four have died.

BLAKEMORE and Lord[1] and Whipple[17] stimulated renewed interest in the problem of portal hypertension with their reports in 1945 of successful venous anastomosis which permitted portal blood to flow directly into the systemic circulation, bypassing obstructions in the usual portal pathway. Their original technique of performing the venous anastomosis with vitallium tubes has been supplanted by the method of direct suture anastomosis. The principle of the venous shunt, however, remains as one of the most effective methods of relieving portal hypertension. Von Eck[5] in 1877 performed the first portacaval anastomosis in dogs, using a side-to-side technique that has become known as the Eck fistula. Whipple[18] has observed dogs with Eck fistulas for as long as eight years. These animals had occasional episodes which were attributed to disturbed protein metabolism, but they generally maintained a satisfactory state of health. Prior to the reports of Blakemore, Lord and Whipple, isolated attempts had been made to apply this principle of shunting blood directly into the systemic circulation in cases of portal hypertension. Minor branches of the portal and systemic system were usually employed and thrombosis at the site of anastomosis invariably accounted for the failure of the procedure.

Blood carried into the portal area passes through two capillary systems before returning to the heart. It passes through a set of capillaries in the viscera, from which it is collected into the veins of the portal system and is then carried to the second set of capillaries in the liver. From here, it is returned to the heart by way of the inferior vena cava. Any condition which inhibits the free flow of blood in the portal system into the inferior vena cava usually increases the pressure of the blood in all or a part of the portal system.

Patients with an elevation of the venous pressure in the portal system may be divided into two main groups as suggested by Whipple: Group I, those having an intrahepatic portal block; and group II, those having an extrahepatic block.

INTRAHEPATIC BLOCK

Intrahepatic block is usually associated with cirrhosis of the liver. The actual cause of portal hypertension in cirrhosis has not been clearly demonstrated. It has been suggested that intrahepatic fibrosis narrows the lumen of the portal vein

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branches inside the liver and that the resulting increased resistance to the flow of blood is responsible for the elevated pressure.

Herrick's[7] studies of increased portal pressure in cirrhosis emphasized the communication of the portal venous system and the hepatic arterial system in their smaller branches inside the liver. The studies also emphasized the pronounced effect on portal pressure occasioned by slight increases of hepatic arterial pressure in the cirrhotic liver. In the normal liver Herrick found a rise of 1 mm. of mercury in the portal pressure for every 40 mm. elevation of arterial pressure. In the cirrhotic liver there was 1 mm. rise of portal pressure for every 6 mm. elevation of arterial pressure. Gad[6] also demonstrated that increased pressure in the hepatic artery retarded the portal flow.

McIndoe[9] failed to confirm these findings of the effect of the arterial pressure changes on the portal pressure. However, he made the important observation that only 13 per cent of fluid that perfused through the portal vein in the cirrhotic liver could be recovered from the hepatic vein; the remainder was lost through collateral vessels. McIndoe concluded that the elevated portal pressure resulted from a gradual shutting off of portal blood from the hepatic cells as interlobular fibrosis increased.

The case histories of 65 patients admitted to the Wadsworth Veterans Hospital with a diagnosis of cirrhosis of the liver have recently been reviewed. The average age of the patients in this all-male series at the time of admission was 51 years. Eighty-one per cent of the patients were between 40 and 60 years of age. All the patients with advanced cirrhosis had histories of excessive alcoholic intake and many of the acute exacerbations of their illnesses were preceded by bouts of heavy drinking.

In 33 of the cases there was evidence of esophageal or gastric varices with bleeding into the alimentary tract. Ascites was present in 50 of the patients, and 19 had both varices and ascites. Active duodenal ulcer was demonstrated in four cases.

In 58 cases with complete follow-up records, there were 30 deaths, a mortality rate of approximately 52 per cent. The immediate causes of death were as follows: Hemorrhage into the gastrointestinal tract in 15 cases, hepatic failure in 10 cases, and miscellaneous causes in five cases. The duration of the disease in relation to the cause of death is indicated in the following table:

Duration of disease	Number of patients	Living	Dead	Cause of death*		
				Hem.	Hep.	Other
0 - 3 mo.	8	4	4	1	2	1
3 mo. - 1 yr.	6	3	3	1	2	
1 yr. - 3 yr.	25	10	15	8	5	2
3 yr. - 10 yr.	14	8	6	5	1	
10 yr. plus	4	3	1			1
Unknown	1	0	1			1
Total	58	28	30	15	10	5

Mortality rate, 52 per cent.

*Hem.: Hemorrhage. Hep.: Hepatic failure.

Ratnoff and Patek[14] reported that 40 per cent of patients who have hemorrhage from esophageal varices die within one month of the first hemorrhage.

It is obvious that the prognosis for the cirrhotic patient in the past has been grave. Although portal hypertension is only a secondary manifestation of the primary disease process in the liver, a high percentage of cirrhotic patients die as a result of events directly related to the increased portal tension. It would follow that an acceptable period of palliation might be anticipated if the venous pressure in the portal system could be reduced. The most satisfactory results would be obtained in inactive cases and in those cases in which the disease process in the liver was least severe.

Blakemore[2] classified cases of cirrhosis into three groups in regard to their suitability for operation: Group I, cases in which ascites or tendency to hemorrhage is based on the inability of the damaged liver to form albumin or prothrombin in adequate amounts. Portacaval anastomosis is not indicated in this group. Group II, cases in which the liver function is adequate to furnish the required amount of protein and prothrombin but in which a severe degree of portal hypertension has supervened as a result of fibrotic contraction and periportal fibrosis. Wasting ascites and severe hemorrhage can be controlled in this group by portacaval shunt. Group III, cases in which there are varying degrees of depressed liver function plus evidence of considerable elevation of the portal pressure. These cases must be considered individually and the response of liver function under treatment observed over a period of time. Certain of the patients will be candidates for operation, but the optimum time for operation must be carefully selected. Patients with massive recurrent hemorrhage, at times, may be operated upon despite an inadequate period of preparation. If the liver function is seriously depressed at the time of operation, the prognosis is grave, even though a successful anastomosis is completed.

EXTRAHEPATIC BLOCK

There are two conditions which may cause an extrahepatic block: (1) splenic vein thrombosis, or (2) a block in the portal vein, resulting in portal hypertension.

Splenic vein thrombosis. If the block or thrombosis occurs in the distal portion of the splenic vein and interferes solely with return of blood from that organ, enlargement of the spleen occurs and there may be anemia and leukopenia, the result of so-called hypersplenism. Enlarged collateral vessels usually develop in the vasa brevia between the spleen and the stomach, but gross bleeding into the alimentary tract does not occur. For this condition splenectomy alone will provide adequate relief of the patient's symptoms. Such isolated thrombosis of the splenic vein is quite rare but it undoubtedly accounts for the occasional satisfactory result which has followed splenectomy in the treatment of patients with Banti's disease in the past.

Should the thrombus be proximal to the junction

of the splenic and coronary veins, however, and thereby obstruct the blood flow of the coronary vein from the lower esophagus and the lesser curvature of the stomach, the patient will eventually develop gastric and esophageal varices with resulting hemorrhage into the alimentary tract. Splenectomy alone in such cases will not permanently alleviate the dilatation of the gastric and esophageal veins. Such a condition occurs so regularly in cases with Banti's disease that Blakemore, Welch, Linton and others have strongly advised against splenectomy alone unless the surgeon can be certain that the pressure in the coronary vein is not elevated and that the block is confined to the splenic vein. Thrombosis of the splenic vein following splenectomy eliminates the possibility of performing a splenorenal vein anastomosis and thereby removes the best opportunity the patient has for relief of the hypertension in the coronary vein.

Portal hypertension resulting from a block in the portal vein. Although the entire visceral venous bed is usually referred to as the portal system, the portal vein *per se* is formed at the juncture of the splenic and superior mesenteric veins. This vein lies, for the most part, in the posterior part of the hepatoduodenal ligament and runs from the under or dorsal surface of the head of the pancreas to the hilus of the liver. Acute blockage of the portal vein from trauma or sudden complete thrombosis in man is usually fatal. There are three conditions which may obstruct the portal vein and produce hypertension throughout the portal system.

(a) "Cavernous transformation" of the portal vein. The origin of this condition is uncertain but it is usually thought to be a condition which arises early in the life of the individual either as a congenital malformation of the portal vein, as an extension of the obliterative process in the ductus venosus to involve the portal vein, or as a result of an inflammatory thrombosis arising from an infection in the umbilicus extending down the umbilical vein to involve the portal vein. Exploration of the hepatoduodenal ligament in later years will reveal a number of dilated, thin-walled tortuous veins instead of a single large portal vein, whence the name, "cavernous transformation."

(b) Thrombosis of the portal vein. At any age the portal vein may be the site of formation of a thrombus. Such a condition may be associated with an inflammatory process in the abdomen, or develop following trauma to the abdomen. More frequently it is idiopathic or of unknown origin. The process probably starts as a partial obstruction, but it may progress to complete occlusion of the portal vein followed by the development of collateral vessels in the hepatoduodenal ligament and other collateral areas.

(c) External compression. The portal or splenic veins may be obstructed by an adjacent inflammatory cicatrix associated with pancreatitis or cholecystitis; rarely, neighboring tumors or cysts may, by compression, interfere with portal blood flow.

SYMPTOMS ASSOCIATED WITH PORTAL HYPERTENSION

The symptoms frequently associated with portal hypertension may be grouped in the following manner, although clinically they may appear singly or in combination:

1. Effects due to enlargement of the spleen. The anemia and leukopenia in cases of Banti's disease are usually attributed to the effects of hypersplenism.

2. Effects of collateral circulation. Certain collateral vascular systems become established when portal obstruction and hypertension persist. These are described as follows:

(a) Accessory portal veins of Sappey. These are multiple small veins about the liver and portal vein, which communicate through the subdiaphragmatic and retroperitoneal areas with the systemic system. Included in this group are the vessels which course along the ligamentum teres to the umbilicus to anastomose with the epigastric veins in the abdominal wall. Clinically, the presence of such veins is often helpful in indicating portal obstruction as the superficial abdominal veins become dilated, and rarely a cluster of veins about the umbilicus, the caput medusa, may be visible.

(b) Veins of Retzius in the retroperitoneal area are important collateral vessels but are usually not demonstrable.

(c) Hemorrhoidal veins. The collateral anastomosis between the superior and inferior hemorrhoidal veins produces internal and external hemorrhoids.

(d) Cardiac and esophageal veins. Collateral pathways may be established to carry blood through these veins into the azygos system. Bleeding from these veins is, of course, one of the prime symptoms of portal hypertension.

3. Abnormal filtration through portal bed. The formation of ascitic fluid does not occur in cases in which obstruction is confined to the splenic vein. It occurs infrequently in cases in which there is obstruction of the portal vein but in which liver function is normal.

Ascites is frequently observed in the cirrhotic patient. Here it is undoubtedly produced by a combination of factors: (a) The increased hydrostatic pressure inside the branches of the portal vein; (b) disturbance of the normal constituents of the serum (a result of impaired liver function), the disturbance resulting in the passage of fluid from the veins into the peritoneal cavity. The relative importance of these two factors must be weighed in considering operation to reduce portal hypertension.

OPERATIVE PROCEDURES

The operative procedures which have been advocated in the treatment of portal hypertension or its secondary manifestations may be listed as follows:

I. Drainage procedures: (a) Insertion of glass button into abdominal wall; (b) saphenoperitoneal anastomosis; (c) pyeloperitoneal anastomosis.

II. Portal-systemic venous shunt: (a) Omento-

pexy; (b) portacaval, splenorenal and other direct venous anastomoses.

III. Direct treatment: (a) Injection of esophageal varices; (b) ligation of varicosities; (c) esophagogastric resection; (d) mediastinal packing.

Crosby and Cooney[4] in 1946 reported six cases in which patients with pronounced ascites were treated by the insertion of a glass button of original design into the lower abdominal wall; a procedure which permitted the escape of ascitic fluid into the subcutaneous tissue. All the patients were considered benefited by the procedure. The longest period of postoperative observation was 11 months. Lord[8] subsequently added two modifications to the procedure: The creation of a large subcutaneous pocket and the removal of fascia overlying the abdominal muscles. The author's experience with this procedure in three cases in which the modification of Lord was used was unsatisfactory. However, in one patient recently observed, ascites had been controlled satisfactorily for 18 months after insertion of a Crosby-Cooney glass button at another hospital. When the patient was observed by the author, intractable ascites had returned, apparently from lack of absorption of fluid in the subcutaneous tissue.

Isolated reports of successful saphenoperitoneal and pyeloperitoneal anastomoses have appeared, but the methods have never been widely used. Intraperitoneal obstruction of the ostia of such anastomoses would seem likely. The results of the various omentopexy procedures have been uniformly disappointing.

Bleeding from esophageal varices has been satisfactorily controlled by the injection of sclerosing solutions into the veins.[10, 11] Although such injections may obliterate certain of the collateral channels without reducing the portal hypertension, the procedure probably should be more widely used as a palliative measure in cases of cirrhosis with bleeding varices and extensive hepatic damage.

Som and Garlock[16] have reported two cases in which bleeding from esophageal varices was relieved by the packing of gauze about the esophagus in the upper mediastinum. It was felt that the pack promoted the formation of granulation tissue and the subsequent development of collateral vessels between the esophageal veins and the deeper venous channels of the mediastinum.

An esophagogastric resection in treatment of bleeding varicosities was reported by Phemister and Humphreys[13] in 1947. They suggested that the probable source of bleeding in cases of portal hypertension in which no gross bleeding point could be found was the engorged venocapillary network in the mucosa. Shafer[15] recently reported encouraging results in the treatment of six patients by this method.

Pattison[12] reported 14 cases of cirrhosis of the liver in which exploration was carried out. In ten of the cases a portacaval shunt was performed. There was one postoperative death. Numerous other small series or single successful cases have been reported; however, the great operative difficulties, arising chiefly from extensive collateral vessels, and the frequent occurrence of serious postoperative complications such as thrombosis at the site of anastomosis, adherence and closure of the suture line, and hepatic failure have made many surgeons question the ultimate usefulness of venous anastomosis in the treatment of this condition.

The direct shunt of blood from the portal system to the systemic circulation by means of venous anastomoses would seem to offer the most satisfactory method of reducing portal hypertension for a prolonged period. Blakemore[3] recommended anastomosis of the portal vein to the inferior vena cava whenever possible. The progress of four patients with anastomosis of this type was followed by him for more than two years. Response of hepatic function to this type of shunt did not appear to differ from that observed in patients in whom the splenorenal type of shunt had been employed. In Blakemore's series of 60 cases there were 11 postoperative deaths following portacaval anastomosis.

The following data were obtained through the study of 18 patients with portal hypertension treated surgically by the author or other members of the staff of Wadsworth Veterans Hospital:

Six of the patients are known to have died since operation. One patient who had total gastrectomy and esophagojejunostomy for hemorrhage has had no further bleeding in the three years since operation. Two were treated by splenectomy alone because a satisfactory vein for anastomosis could not be found in the splenic pedicle. One of them has shown improvement over a short postoperative period; the other has continued to have hematemesis and is unimproved.

Portacaval shunt operations were done in 15 cases. In eight of the 15, splenorenal anastomosis was used, with the following results: Two of the patients are well, four are considered improved, and two have died. In the remaining seven cases, the end of the portal vein was anastomosed to the side of the inferior vena cava. The results: Two of the patients are considered improved, one is unimproved, and four have died.

Of eight patients with intrahepatic block who were subjected to portacaval shunt, four are improved, one is unimproved, and three have died. Of ten patients with extrahepatic block, six are improved postoperatively, one is unimproved, and three have died.

In the six cases in which the patient died, the duration of life after operation, and the cause of death were:

	Survival	Cause of death
1.	7 days	Thrombosis at site of anastomosis
2.	5 days	Portal vein found thrombosed at time of exploration. Thrombus removed and portacaval anastomosis performed. Thrombus reformed with extension
3.	10 days	Hepatorenal failure
4.	3 days	Extensive pancreatic necrosis
5.	4 months	Closure of anastomosis
6.	47 days	Hepatic failure

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The Use of Aerosol Penicillin and Streptomycin in Bronchopulmonary Infections

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SUMMARY

Three hundred patients with subacute or chronic non-tuberculous bronchopulmonary disease were given aerosol therapy, chiefly penicillin and more recently penicillin combined with streptomycin. The result showed that the inhalation of these antibiotics is a useful procedure in the treatment of tracheobronchitis, either subacute or protracted, or in association with bronchial asthma, bronchiectasis or pulmonary emphysema. The method of administration is simple.

VOLUMINOUS literature[11] during the past several years testifies to the intense interest in the use of aerosol therapy in bronchopulmonary disease. Much of the basic aerosol work was carried out by Barach,[2, 3] Segal,[9, 10] Olsen,[7] and Bryson,[5] but a significant earlier contribution (1935) was the nebulization of 1:100 epinephrine solution by Graeser and Rowe[6] for the relief of bronchial asthma. Later, the sulfonamides[1] and sulfones[4] were subjected to nebulization. It was only natural that attempts would be made to nebulize penicillin into the lungs.[3] Eventually, streptomyin was similarly used.[8] It is apparent that a new method of administration of drugs by inhalation has been opened to the practicing physician. There have been both enthusiasm for and criticism of this method in the treatment of bronchial asthma, pneumonia, bronchiectasis, lung abscess, chronic bronchitis and sinusitis.

Since December 1944, the authors have used penicillin aerosol and more recently a combination of penicillin and streptomycin in approximately 300 patients with various non-tuberculous bronchopulmonary infections.

MATERIAL AND METHODS OF STUDY

The 300 patients were studied in regard to respiratory tract infection. In each instance, a complete history was taken and physical examination was followed by fluoroscopy and/or x-ray examination of the chest. Laboratory work included blood cell counts, sedimentation rate determination and routine sputum examinations usually before and after aerosolization. Bronchoscopy and bronchography were carried out when indicated.

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As shown in Table 1 the types of bronchopulmonary disease under study fall into five principal categories: (1) subacute or protracted tracheobronchitis, (2) chronic bronchiectasis, (3) pulmonary emphysema with respiratory infection, (4) bronchial asthma with superimposed respiratory infection, and (5) bronchopneumonia.

The equipment for the administration of the aerosol penicillin and streptomycin consisted of a 160-gallon portable oxygen tank with a flowmeter and a Vaponefrin® or Asthmanephrin® nebulizer. Crystalline penicillin G was put in a saline solution so that each cubic centimeter contained 50,000 units. When streptomycin was added each cubic centimeter of solution contained 100 mg. of the antibiotic. In addition, from 0.5 cc. to 1 cc. of 1 per cent phenylephrine was added to each 200,000 units of penicillin solution. Inhalations were given at home or in hospital every three hours for three to five days or longer as the case required. A codeine cough mixture was routinely administered every three to four hours in those patients with moderate or severe cough in an effort to reduce loss of the antibiotic.

EVALUATION OF RESULTS

Since cough and expectoration are a common denominator of bronchopulmonary disease, evaluation of the results of aerosol therapy centered about these symptoms. In addition, the volume of sputum was roughly measured before and after treatment,* the character of it was noted and a routine Gram stain was made. Conversion from a copious amount of mucopurulent or purulent sputum containing numerous Gram-positive and/or Gram-negative organisms to a small amount of clear or mucoid sputum in which there are few or no organisms on Gram stain was considered a reasonable indication of a satisfactory result with aerosol therapy. Invariably when such changes take place, cough subsides or disappears, fever (if present) abates, and rales diminish in number or disappear. Evaluation of the results of the treatment of asthma and bronchopneumonia will be considered separately.

RESULTS OF TREATMENT

Group 1: *Subacute or protracted tracheobronchitis*† (131 cases). In this group of patients, who

*A reduction of 75 per cent or more in the volume of sputum is considered a good result, a 50 per cent reduction a fair result, and 25 per cent a poor result.

†This group comprises only those cases in which there was bacterial inflammation of the trachea and larger bronchi complicating the usual upper respiratory illness called the "common cold." As far as possible patients with underlying pathologic conditions such as bronchiectasis were excluded from Group 1 and placed in the appropriate subsequent group.

TABLE 1.—*Results with Penicillin Aerosol Therapy*

Diagnosis	Number of Cases	Reduction in Cough and Sputum		
		More than 75%	50%	Less than 25%
Subacute or protracted tracheobronchitis	119	98	16	5
Chronic bronchiectasis	47	25	15	6
Pulmonary emphysema with respiratory infection	46	28	12	6
Bronchial asthma with respiratory infection	30	21	8	1
Bronchopneumonia	21	19	2	0
Totals	263	191	53	18

invariably described their illness as a "chest cold that hangs on," results with aerosol therapy were uniformly gratifying. The usual duration of the "chest cold" before the inhalational routine was started was 14 to 28 days, but in many instances it was six to eight weeks. During this interval the majority of patients had received some form of treatment including "shots of penicillin" or "sulfa," cough mixtures and other remedies. As a rule, 24 hours after the onset of the aerosol treatment the cough subsided, the sputum became less purulent and was reduced in amount. In the majority of instances bronchopulmonary symptoms were minimal in degree after 72 hours of inhalational therapy. In the remainder of the series it was necessary to prolong the inhalations for several days to effect clinical cure. In those cases in which recovery was delayed either the patients had failed to take the inhalations correctly or they harbored penicillin-resistant organisms in the sputum. Much of the latter was later remedied by adding streptomycin to the aerosol. Finally, in some of the cases in which results following nebulization were unsatisfactory, it was found that a more serious underlying disease was being masked by the tracheobronchitis. As shown in Table 1, 119 patients with tracheobronchitis received penicillin aerosol. Of this number 98 had better than 75 per cent reduction in cough and sputum, 16 had a 50 per cent reduction and five a reduction of less than 25 per cent. Results with combined antibiotic aerosol therapy were satisfactory in 12 cases of subacute or protracted tracheobronchitis in which the treatment was used.

Group 2: *Chronic bronchiectasis* (60 cases). In the majority of patients in this group, tracheobronchitis caused an acute flare-up of the disease and brought the patient under treatment. The 24-hour collection of sputum was usually several ounces or more of thick, grayish green or yellow purulent or mucopurulent exudate. Following several days of inhalation of the antibiotics the sputum was usually reduced in amount, had thinned out, was less purulent or more mucoid in character. Accompanying these changes was a corresponding reduction in cough and abatement of fever and malaise. The best results were obtained in those cases in which combined penicillin and streptomycin was used. It was necessary to employ the procedure for at least seven to ten days in the average case to insure the best possible result, and several patients in the series required a much longer schedule of treatment. Benefit, however, was usually only temporary, lasting from several days to several months. As shown in Table 2, 47 patients with bronchiectasis had penicillin inhalations. Good results were obtained by 25 of them and fair results by 15; six patients were little benefited. Results were better, however, in those patients given combined antibiotics (Table 2).

Group 3: *Pulmonary emphysema with respiratory infection* (51 cases). The patients in this group, chiefly males over 50 years of age, had chronic productive cough usually associated with dyspnea and some wheezing. Many of the patients were diagnosed either as asthmatic or as having so-called chronic bronchitis. Question arose as to the coexistence of bronchiectasis in these patients. Undoubtedly, such was often the case but bronchographic proof is lacking. However, in almost all cases acute tracheobronchitis complicated the chronic process and brought the patient under medical care. Results* with aerosol therapy were generally encouraging, as noted in Tables 1 and 2. Of the 51 patients, 33 experienced satisfactory reduction of the productive cough, 12 others had a fairly good result, but six received little benefit. It was of interest that several of the latter seemed to derive more benefit from mercurial diuretics than from antibiotics, suggesting an element of congestive heart failure was present rather than (or in addition to) infection.

*As in Group 2 it was usually necessary to continue the aerosol therapy for a longer period than for Group 1.

TABLE 2.—*Results with Combined Antibiotic Aerosol Therapy*

Diagnosis	Number of Cases	Reduction in Cough and Sputum		
		More than 75%	50%	Less than 25%
Subacute or protracted tracheobronchitis	12	12	....	....
Chronic bronchiectasis	13	11	1	1
Pulmonary emphysema with respiratory infection	5	5	....	....
Bronchial asthma with respiratory infection	11	10	1	....
Bronchopneumonia	2	2	....	....
Totals	43	40	2	1

Group 4: *Bronchial asthma with respiratory infection* (41 cases). In patients in this group a "chest cold" (tracheobronchitis) seemed to act as a trigger mechanism in precipitating the attack of asthma. Relief of the asthma was difficult and often impossible with the usual "asthma" drugs unless the infection was first effectively treated. Aerosol penicillin and streptomycin were used to treat the bacterial infection, and following this the various sympathomimetics, antihistaminics, etc., were effective in relieving the asthma. In no instance of asthma without infection was antibiotic aerosol therapy of any value. In Table 1 are listed results of aerosol penicillin in 30 Group 4 patients. Twenty-one had satisfactory improvement in the respiratory infection and eight had fairly good results. Results with combined antibiotics in ten patients were quite gratifying (Table 2). In 32 of the 41 patients in the group, the asthma was rather promptly brought under control by means of antihistaminics, bronchodilators, etc., after treatment with aerosol antibiotics.

Group 5: *Bronchopneumonia* (23 cases). This group comprised patients who sought medical care because of a "heavy chest cold." Bronchopneumonia in these patients was in each instance a sequel of tracheobronchitis—in fact the culmination of severe descending respiratory tract infection. Fever, malaise and productive cough were present. Fluoroscopic examination usually supplemented by roentgenograms of the chest revealed a significant patch or several patches of infiltration in the lung. Subsequent sputum examination was negative for tubercle bacilli but on Gram stain numerous Gram-positive organisms were found. Aerosol therapy cleared the infiltration in all cases. Resolution of the pneumonic exudate seemed slower in emphysematous subjects. Table 1 shows results of penicillin aerosol in 21 patients with bacterial bronchopneumonia.

DISCUSSION

The results of this study, in agreement with those of other investigators,[2, 7, 9] show that aerosol therapy is a useful procedure in the treatment of some of the common non-tuberculous bronchopulmonary diseases. Inhalation of antibiotics has no place in the treatment of the common cold. Nor is there a valid indication for use of the method in the treatment of allergic non-infective bronchial asthma. But in the complications of these diseases, in purulent tracheobronchitis usually called a "chest cold" by laymen and physician alike, aerosol penicillin and/or streptomycin (depending on the bacterial flora) is a promptly effective form of treatment. The same holds true when infection—bacterial tracheobronchitis, for example—complicates bronchial asthma or pulmonary emphysema. In that circumstance, inhalation of the appropriate antibiotic often cures the infection, permitting effective action of "physiologic therapy"[2] for the underlying disease.

The best treatment for bronchiectasis is lobectomy. Olsen[8] demonstrated the value of preoperative aerosol therapy in patients with this disease: The pronounced reduction of purulent sputum following inhalational therapy both eased the operative difficulties and diminished complications. The authors' experience coincides with that reported by Olsen. However, lobectomy is not suitable for all persons with bronchiectasis. In this unfortunate group of patients aerosol therapy has afforded significant even though only temporary benefit. Inhalation of the antibiotic has proven of greater value than parenteral administration. Inhalational therapy is, after all, topical therapy to the inflamed respiratory passages.[5] Hence, the factor of maximum local concentration of the antibiotic used is of fundamental importance in explaining the superiority of the aerosol route over the parenteral route of administration. Furthermore, a congested edematous bronchial membrane pouring out mucoid, mucopurulent or purulent exudate will interfere with the permeability of the diffusion surface (mucosa) and retard absorption of the antibiotic through it, with the result that higher and more prolonged concentration of the antibiotic is attained by topical application. In addition, impaired blood supply in scarified dilated bronchi, as in bronchiectasis, interferes with the injected drug's reaching the infected area. On the other hand, the mechanical factors of viscosity and thickness of purulent secretions probably play a role in retarding the effectiveness of topical therapy.[5] Because of these interfering factors, detergents (Zephiran®) are now being used in combination with the antibiotics for nebulization. As detergents have emulsifying properties and lessen surface tension, they liquefy purulent exudate and permit more uniform and better penetration of the antibiotic.

There seems to be rather limited indication for aerosol therapy in bacterial bronchopneumonia. Parenteral administration of antibiotics is surely the method of choice for patients with that disease. However, in cases of bacterial bronchopneumonia in which the lungs are emphysematous, or when the disease complicates bronchiectasis, the inhalational route has seemed to speed resolution of the inflammatory process. Perhaps this is related in part to the previously mentioned factor of poor blood supply in such cases.

Early experience of Barach, Olsen and others with use of a single antibiotic in aerosol therapy showed that only Gram-positive organisms disappeared from the sputum. Following nebulization, considerable pulmonary exudate often remained and clinical improvement was not fully satisfactory. Sputum analysis showed that numerous Gram-negative organisms remained. The experience of the authors of this presentation in this regard has been similar. Streptomycin was thus the logical drug to use in such cases because of its bacteriostatic effects on Gram-negative organisms. Furthermore, Abraham and Chain (cited by Olsen[8]) found that these Gram-negative organisms elaborate an enzyme, penicillinase, which inactivates penicillin. In view of this the authors routinely made a Gram stain of sputum prior to antibiotic therapy; whether to use a single antibiotic or a combination was determined on the

basis of results of examination of the stained material. In actual practice, almost all sputum contains both Gram-negative and Gram-positive organisms, thus indicating the need for combined antibiotics in aerosol routine.

Various other drugs—detergents,[5] bronchodilators,[2] and bronchovasoconstrictors[2]—have been combined with the antibiotics used in aerosol therapy. In the authors' experience, 1 per cent phenylephrine seemed to enhance the value of the aerosol, probably due to bronchovasoconstricting qualities, thus slowing absorption of the antibiotic from the diseased area.

Oral complications such as glossitis and stomatitis resulting from the use of penicillin aerosol occurred in roughly 5 per cent of the cases in the series here reviewed. The frequency of these complications was found to be less if an antihistaminic solution (Benadryl® or Pyribenzamine®) was added to the aerosol.

It must be emphasized that aerosol therapy is not an office procedure. For good results, inhalations must be taken at least four or five times a day for several days. Hence, it is a home or hospital procedure. Generally poor results of sporadic use of aerosol treatment in the office have discouraged many physicians. In addition, a suitable nebulizer* must be used, one that provides an aerosol composed of particles 5 microns in diameter or less.[5] Larger droplets stop on the walls of the upper respiratory passages and are not carried into the smaller ramifications of the tracheobronchial tree. Attention to details and careful instructions to patients are essential for the attainment of good results. The excellent benefits obtained, particularly in stubborn protracted tracheobronchitis, in bronchiectasis and in infective asthma, more than justify the use of inhalational therapy.

*Vaponefrin® or Asthmanephrin® are the best, in the authors' experience.

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The Preoperative and Postoperative Care of Acute Arterial Obstruction

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SUMMARY

Acute arterial obstruction may result not only from arterial injuries but also from thrombosis or embolism. The fate of the extremity is generally decided in the first few hours following the obstruction of the major artery. It is therefore essential that physicians should be able to recognize acute ischemia of the extremities and institute treatment which will prevent permanent damage and facilitate the reestablishment of normal circulation.

Direct application of heat should be scrupulously avoided since the reduced blood flow is unable to supply increased metabolic demand. The extremity should be placed at or just below heart level so as to avoid both the ischemia of elevation and the edema of dependency. Pressure in the form of either encircling plaster or even compression bandages should be avoided and the extremity simply immobilized by a posterior splint. General supportive treatment is essential to maintain adequate pressure and composition of the arterial blood. In selected cases, agents to overcome vascular spasm or to prevent extension of intravascular thrombosis are indicated.

ACUTE obstruction of a major artery to an extremity is an emergency, both medical and surgical, since the fate of the extremity is generally sealed within the first six hours after the occlusion. By the end of that time, if the ischemia has been sufficiently severe, irreparable damage has been done to the nerves and muscles. In addition, intravascular thrombosis may spread both proximally and distally so as to shut off the collateral circulation and lead to still greater tissue ischemia.

Early recognition of acute arterial obstruction is therefore mandatory, and it may be well first to consider the possible causes of this condition.

ETIOLOGY

Acute thrombosis of a major artery is the most frequent cause of acute arterial obstruction. This thrombosis may be on the basis of atherosclerosis or of inflammatory arteritis such as, for example, that seen in Buerger's disease. The possibility of acute arterial embolism should be considered, especially in a patient who has auricular fibrillation with or without mitral stenosis or a recent coronary occlusion with myocardial infarction. In certain cases of acute arterial obstruction it is not possible to make the differentiation between thrombosis and embolism, but generally patients with acute thrombosis of a major artery will give a history indicative of some form of arterial insufficiency in the extremities before the acute episode. Certain types of arterial embolism such as that from tumor tissue or the paradoxical embolus from venous thrombosis are so rare that detailed discussion of them is not warranted in a communication such as this.

In addition to the more obvious causes, acute arterial injuries may occur as a result of deliberate procedure or by accident during the course of surgical operations. It is well to keep in mind also that the artery itself does not necessarily have to be injured to produce acute arterial obstruction. It may be compressed. Such compression occasionally occurs as the result of a fracture or a dislocation and may even result from a hematoma or from bleeding which takes place within an enclosed space. The subfascial hematoma which develops in either the upper or lower extremity with resultant tissue ischemia is an example of this form of compression.

Spasm of the artery, the so-called local segmental arterial spasm, as Kinmonth, Simeone and Perlow have shown, is probably due to a stretching of vascular (either artery or vein) smooth muscle. This condition may occur as a sequel to trauma, or spontaneously as a result of development of acute venous thrombosis or the lodging of an arterial embolus. Local arterial spasm is apparently myogenic in character and does not respond to interruption of sympathetic ganglia or in the perivascular nerve plexus.

SIGNS AND SYMPTOMS

Early recognition of acute arterial obstruction depends upon alertness to the signs and symptoms of the condition. Generally the first symptom of which the patient complains is numbness of the extremity, with pain, frequently excruciating, following. Weakness is noted, with paralysis developing if the ischemia is severe. When the extremity is observed it is generally pallid and, especially in the early stages, may have a waxy appearance. This blanching is succeeded by mottling with areas of cyanosis contrasting sharply with the general background of pallor. In the late stages cyanosis develops and ultimately there is complete stasis of blood

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in the smaller vessels. In the last stage the skin takes on a peculiar reddish appearance, but by that time it is clear that all hope for survival of the extremity is lost.

Skin temperature changes may best be noted by contact with the dorsum of the examiner's hand, comparing the two extremities preferably at a room temperature of approximately 75° F. It is important especially to note the level on the two extremities at which there is a sudden gradient of skin temperature. The level of adequate cutaneous blood flow is generally considerably distal to the point of obstruction of the main artery. For example, with occlusion of the superficial femoral artery the point at which difference in skin temperature is noted is generally just below the knee, while with obstruction of the popliteal artery, the surface of the leg is usually warm to just above the ankle.

Palpation of the muscles of the extremity frequently is of help in the diagnosis of acute arterial obstruction. Early in this condition the muscles feel doughy. At a later stage the muscles will become infiltrated and hard, finally developing the wooden character noted in Volkmann's ischemic contracture. At this stage irreparable damage has been done to some if not all of the muscle fibers, since this condition is in reality simply rigor mortis.

PROGNOSIS

The nerves to the extremity are the first tissues to be affected by lack of oxygen, and they therefore furnish the most delicate indicator of the degree of ischemia. By noting the level of cutaneous anesthesia and the extent of muscle paralysis or weakness, the severity of ischemia due to acute arterial obstruction may readily be followed. It is particularly useful to mark on the skin with ink the level of cutaneous anesthesia, since frequently the prognosis and therefore the choice of treatment will be determined by the hourly changes in the level of cutaneous anesthesia.

TREATMENT

The immediate treatment of acute arterial obstruction is guided by the well-known dictum, do no harm. Do not apply heat, do not apply pressure, do not elevate.

The local application of heat increases the metabolic demands of the tissues. In the presence of acute arterial obstruction, since the quantity of blood which can reach the part is mechanically limited, the application of heat locally serves only to increase the discrepancy between the needs of the tissues and the supply of blood available to meet those needs. Application of extreme cold should also be avoided, since the tissues are injured thereby. The authors have never seen an extremity saved which was packed in ice in the treatment of acute arterial obstruction. It is advisable to maintain the extremity at a room temperature of 75° F. or below or possibly even to apply cold, wet towels, but this is only of use as emergency treatment until the mechanical obstruction has been relieved or until collateral circulation has taken over the function of the obstructed vessel.

Avoidance of pressure is essential in the treatment of acute arterial obstruction. Not only should pressure from encasing plaster or circular bandages be avoided, but also the pressure upon bony parts caused by the weight of the extremity itself. Pressure over the heel and the lateral malleolus should be prevented by supporting the lower leg on a pillow or soft, rolled-up blanket. The extremity should be placed in a position of relaxation with partial flexion at the joints. If immobilization is required because of soft tissue injury or fracture, it should be achieved without the use of external pressure. A posterior plaster splint, a pillow, or even skeletal traction is to be preferred to any form of treatment which exerts pressure upon the tissues. In the presence of acute arterial obstruction, the pressure in the smaller blood vessels is already low. Complete ischemia may be produced by even the mildest compression.

Since the pressure in the smaller blood vessels is already low, elevation of the extremity above the level of the heart will only serve to exaggerate the ischemia. On the other hand, dependency may produce edema with consequent increase in tissue pressure and obstruction of collateral blood flow. It has been repeatedly emphasized that the optimum position of the extremity is at or just below the heart level.

Concern for the extremity should not be so great that the general condition of the patient is overlooked, for the condition of the patient will have much to do with the ultimate fate of the extremity. The collateral blood vessels, upon which the survival of the extremity depends in the first few hours after acute arterial obstruction, are under vasomotor control, and the character of the blood within them is of importance. Shock must be treated not only because of the low blood pressure associated with this condition but also in order to relax the blood vessels and permit an adequate volume of blood to flow to the tissues. Replacement of lost blood by transfusion is indicated not only for the treatment of shock but in order to maintain adequate oxygen-carrying capacity. The administration of oxygen may be necessary to overcome anoxemia which may be the result of conditions other than those producing the acute arterial obstruction.

SYMPATHETIC NERVOUS SYSTEM

At the risk of being considered categorical, the authors believe that sympathectomy is contraindicated in the emergency treatment of acute arterial obstruction. The advantages to be gained from permanent interruption of the vasoconstrictor pathways may often be counterbalanced by the harmful effects of the trauma of the operation itself. Temporary blocking of the sympathetic nerves by single or repeated injections of procaine or other agents into the region of the sympathetic ganglia may be of help if such injections can be performed without too much trauma either to the patient or to the

extremity. It should be remembered that a decrease in blood pressure produced by thoracic or lumbar paravertebral injections may offset any advantage to be gained from the vasodilatation achieved by this procedure.

VASODILATORS

The place of vasodilators in the treatment of acute arterial obstruction has not yet been clarified. In general it is the belief of the authors that these chemicals are probably of no use and may actually do harm since the blood vessels throughout the body are affected, and unless there is a proportionate increase in the cardiac output, the blood flow will be increased in the region supplied by normal vessels to a greater extent than it will be to the tissues of the extremity supplied by the artery which has been obstructed. It is of importance, however, to inhibit vasoconstrictor tone; but this inhibition can be achieved with more benefit by general treatment of the patient. There are certain stimuli which are known to cause vasoconstriction: Cold, pain, fear, low blood pressure, anoxemia. It is these stimuli which should first be removed. Relief of pain is essential, and the administration of morphine or some similar medication is probably of help in opening up the collateral circulation. The effect of papaverine probably derives more from relief of pain than from any specific action on vasospasm. The authors consider the ingestion of alcohol in a palatable form a specific remedy for vasospasm. This treatment should be repeated as often as appears necessary.

ANTICOAGULANTS

In the presence of acute arterial obstruction, anticoagulants may play an important role in the prevention of further extension of intravascular thrombosis. In the presence of mechanical obstruction of the vessel, however, anticoagulants should be used, in the authors' opinion, only if operation is contraindicated either by the character of the obstruction or by the condition of the patient.

INDICATIONS FOR IMMEDIATE OPERATION

The first thing to be considered when operative intervention is contemplated is the general condition of the patient. The life of the patient takes precedence over the saving of the extremity. Operation should be performed only if there are reasonable grounds for considering that the obstruction is mechanical in nature, that it can be relieved, and that less harm than good will be achieved both in relation to immediate and ultimate prognosis in the individual case. An urgent indication for immediate operative intervention is evidence of increasing ischemia of nerve and muscle. The ultimate fate of the extremity must also be taken into consideration. A good recovery of function at the earliest possible time is the goal, and it is the responsibility of the physician to do all in his power to achieve this objective.

POSTOPERATIVE CARE

The general principles emphasized in the consideration of the immediate treatment of acute arterial obstruction can serve as a guide for treatment in the postoperative period.

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Relation of the Adrenal Cortex to Immunizing Mechanisms

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SUMMARY

Experimental evidence is available to support the general conclusion that pituitary-adrenocortical secretion may have an important regulatory role in immunizing mechanisms, including antigen-antibody relationships and the state of tonus of the ground substance of the mesenchyme. The specific contributions of other processes affected by pituitary-adrenocortical secretion to immunizing mechanisms remain to be elucidated.

THE object of this paper is to present experimental evidence for the role of the adrenal glands in immunizing mechanisms. The term "immunizing mechanisms" is used broadly to include processes concerned with both natural and acquired resistance contributing to the defense of the organism, particularly against intoxications, infectious diseases, and environmental stresses. Immunity may connote increased resistance to both non-antigenic and antigenic substances, although antibody responses to specific antigens will be presented to illustrate in part the relation of the adrenal cortex to immunity.

The relation of the adrenal glands to the defense mechanisms of the body, particularly against intoxications, infectious diseases and environmental stresses of the type of anoxia and abnormal temperatures, has been established generally from both morphological and physiological studies. Moreover, pathologists have long suspected the active participation of the adrenal cortex in these circumstances. Hyperemia, edema, hemorrhage, and focal necrosis occur in the adrenal glands following burns, food or chemical poisoning, and acute infections. Conversely, adrenalectomized animals and patients with Addison's disease are exceedingly sensitive to drugs, toxins, and stresses in amounts and degree generally innocuous to the normal individual. The established sensitivity of adrenalectomized animals to anesthetics and to surgical trauma is now being appreciated in connection with operative procedures in human subjects.[15]

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A precise description of the role of the adrenal cortex in immunizing mechanisms has been delayed and partially obscured by the numerous immunological studies which have been conducted with the hormone of the adrenal medulla, namely, epinephrine. The basis of this confusion is now apparent as a result of the observation[7] that epinephrine is a powerful augmentor of the rate of secretion of the hormones of the adrenal cortex. The normal mechanism concerned with adrenocortical secretion is based upon the elaboration of the adrenocorticotropic hormone, ACTH, of the anterior pituitary gland. This pituitary hormone is secreted in greater than normal quantity following exposure of the organism to a wide variety of unrelated stimuli: Inanition; alterations in environmental factors, for example, cold, heat, and anoxia; trauma in the form of tissue injury, fractures and hemorrhage; injections of bacterial toxins, toxic chemicals of the type of arsenic or benzene; anesthetics, such as nembutal; foreign proteins, and a variety of substances normally produced in the organism, for example, histamine, epinephrine, thyroxine, and estrogens.[16] The increased release of adrenocortical steroid hormones, as a consequence of any of these stimuli, does not occur in the absence of the pituitary, and each of the stimuli, therefore, has a common physiological basis, that is, its capacity to increase the output of pituitary adrenocorticotropic hormone. Thus, an increased secretion of epinephrine in the normal individual will elevate the rate of release of pituitary ACTH and result in an increased rate of secretion of the hormones of the adrenal cortex. There is, therefore, an intimate physiological relationship between the secretions of the two endocrine glands which constitute the adrenal gland, namely, the adrenal medulla and the adrenal cortex.

From the foregoing, it would appear that any physiological process which contributes to an immunizing mechanism and is influenced or altered specifically by adrenocortical secretion will also be affected by any one of a wide variety of stimuli which augment pituitary-adrenocortical activity. This general body of information will be of considerable aid in explaining the similarity of certain phenomena of immunity under widely diverse circumstances.

Let us turn now to the question of what pituitary-adrenocortical stimulation, and the consequent increase in circulating adrenocortical steroid hormones, might contribute to immunizing mechanisms. The answer to this question can be derived in part from the established physiological functions of these steroid hormones. In addition to the capacity of the

adrenocortical steroids to alter water, salt, protein, carbohydrate, and lipid metabolism, it has been demonstrated recently that these hormones contribute to certain aspects of immunizing cellular responses, including the development of phagocytic cells, the production of immune globulin, and an increased resistance of tissues to the penetration of foreign substances. Although it is not established clearly that the known physiological effects of pituitary-adrenocortical secretion can explain completely the role of this endocrine mechanism in immunizing reactions, the available evidence does afford a basis for both the present discussion and future investigation.

Of the cells concerned with immunizing mechanisms, the role of reticuloendothelial cells has been known since the fundamental observations of Metchnikoff,[8] initiated in the latter part of the last century. Metchnikoff's classical studies demonstrated clearly the significance of the macrophage and of phagocytosis in immunizing mechanisms contributing to general resistance. The function of the macrophage in immunizing mechanisms appeared to be dependent upon the phagocytic capacity of the cell, which in turn is apparently of importance in the possible role of these cells in the formation of antibodies. This was true not only in relation to the invasion of the body by infectious organisms but also in relation to the defense against soluble toxins or toxic chemical agents.

Another cell type with an apparent role in immunizing mechanisms is the lymphocyte. This cell, like the macrophage, arises from the reticular structures and participates in chronic inflammatory processes of all types, and accumulates at the site of chronic irritation.

In view of these suggested roles of the macrophage and the lymphocyte in immunizing mechanisms, it is of considerable interest and significance that the adrenocortical steroids have a pronounced effect on these two types of cells and on reticuloendothelial cells in general. Increased numbers of phagocytic cells develop in lymphoid structures as a result of increased adrenocortical steroid secretion or injection.[4] Indeed, the histological picture seen in these circumstances is similar in many respects to that observed following a single injection of a bacterial antigen.[2] This ability of adrenocortical steroids to increase the number of macrophages in tissues is a striking contribution of pituitary-adrenocortical secretion to immunizing mechanisms. The physiological importance of this has been illustrated by the observations of Reiss and Gothe,[13] and, more recently, of Gordon and Katch.[5] Both of these groups of investigators have shown that the capacity of the reticuloendothelial system to remove soluble or particulate material from the circulation can be augmented as a result of increased pituitary-adrenocortical activity.

The structure, and therefore presumably the function, of the lymphocyte is also notably affected by adrenocortical steroids. Lymphocyte dissolution and degeneration, with a resultant decrease or involution of lymphoid tissue, is a well-known phenomenon occurring following a wide variety of stresses. These alterations in lymphocyte structure and numbers can be produced[4] either with pituitary ACTH or by the administration of adrenocortical steroids, oxygenated in position 11 of the steroid nucleus. It is of some interest, particularly in view of current interest in the therapeutic use of adrenocortical steroids, that desoxycorticosterone acetate, in the doses employed, does not affect lymphoid tissue structure or function. It seems clearly indicated, moreover, that in most instances the wide variety of stresses which cause augmented tissue involution have their physiological basis on the effect of this stress in augmenting the rate of pituitary-adrenocortical secretion. Indeed, it may be pointed out that there are at present only a very few agents which are known to cause alterations in lymphoid tissue size and function in the absence of the adrenal glands. These agents are: X-radiation, the nitrogen mustards, urethane, and large doses of estrogens.[20]

As to the contribution of the lymphocyte to immunizing mechanisms, it has been demonstrated that in the immunized animal one of the constituents of lymphocytes is antibody globulin.[3, 6, 9] In the normal as well as in the immunized animal, the shedding of lymphocyte cytoplasm and lymphocyte dissolution may be accelerated as a consequence of increased pituitary-adrenocortical secretion, and the constituents of this cell may thus be released to the lymph and eventually participate in metabolic transformations.[19, 21] Therefore, the normal physiological functioning of the lymphocyte may be accelerated by the administration of adrenocortical steroids or as a result of the release in the organism of excessive amounts of pituitary ACTH following any one of the wide variety of stimuli which have been mentioned previously. This is seen, for example, in the fact that the injection of adrenocortical steroids, or increased secretion of these hormones as a result of pituitary adrenocorticotropic hormone injection, causes an elevation of antibody titer, either in a hyperimmunized animal or in a previously immunized animal with little circulating antibody.[19, 21] These experiments suggest that the physiological basis of the anamnestic response is the pituitary-adrenocortical control of lymphocyte structure and function. This would afford an explanation for the anamnestic response which is produced by a wide variety of unrelated stimuli.[1]

These results with antibody production in the intact animal have been extended recently to an examination of the role of the adrenal cortex in the production of tissue antibodies *in vitro*. This approach was suggested for two reasons. First, in studying isolated tissues, the variables affecting the concentration of antibody in the circulation at a particular time would be largely eliminated. Second, the relation of the inflammatory reaction to local tissue antibody production warranted detailed study of the process.

The experimental procedure developed for studying antibody production *in vitro* by isolated tissues

is as follows: Tissues taken from previously immunized animals are minced and immediately incubated under physiological conditions in non-immune homologous serum. The antibody released by the tissue to the serum can be titrated, as can the antibody in the tissue prior to, and at the end of, the incubation period. This recent work[14] suggests that the actual site of antibody production may vary with the mode of immunization employed. When rats or mice are immunized with a single intravenous dose of sheep erythrocytes, the spleen appears to be the most active source of antibody. On the other hand, when the antigen is given in periodic intraperitoneal injections and various tissues taken from the rats at the height of antibody production, the most active release of antibody *in vitro* is observed in incubates of mesenteric lymph nodes. This technique has now been extended to study[18] the effect of the adrenal cortex on tissue antibody production. When a comparison is made of the *in vitro* production of hemolysins against sheep erythrocytes by splenic mince obtained from adrenalectomized and control rats injected intravenously five days earlier with a single dose of sheep red blood cells, it is seen that there is no indication of new formation of antibody in splenic tissue from immunized adrenalectomized rats. However, under the same conditions, tissues of immunized animals that have not been adrenalectomized show a continuing production of antibody during the incubation. In further experiments, it has been demonstrated that tissues from immunized animals, previously injected with adrenocortical hormone, show a degree of antibody production *in vitro* which exceeds that of non-hormone-treated immunized animals.

The question arises whether antigen-antibody reactions in tissues are limited to those tissues in which actual synthesis of antibody occurs. This would not seem likely, in view of extensive experience in the field of passive sensitization. This suggests a rather general capacity of tissues for antibody uptake, and was confirmed experimentally[14] by the simple procedure of incubating tissues from non-immunized rats with antibody-containing serum from immunized rats. In all instances the antibody content of the serum medium decreased, and antibody was apparently taken up by all tissues studied. The influence of the adrenal cortex on this process remains to be investigated and will be of interest in relation to a possible role of the adrenal glands in passive sensitization and immunity.

It is clear, therefore, that the adrenal cortex plays the following roles in influencing immunizing mechanisms: (1) The level of secretory activity of the adrenal cortex is influenced by the administration of an antigen, since antigens may augment, in a non-specific manner, pituitary-adrenocortical secretion. (2) An increased level of circulating adrenocortical steroids has a profound effect on cells of the reticuloendothelial system, namely, macrophages and lymphocytes, which are possibly concerned with the processes of antibody formation and release. (3) The rate of formation of antibodies by specific tissues is considerably influenced by adrenocortical secretion.

Recent observations have revealed yet another role of the adrenal glands in immunizing mechanisms. This role is concerned specifically with the phenomenon of tissue permeability. It has been demonstrated[10, 11] that the intradermal spreading of India ink, mixed with either saline or testicular hyaluronidase (spreading factor), is inhibited by adrenocortical extract. This inhibition is produced when the extract is administered either intraperitoneally or intradermally at the site of India ink injection. When administered locally, the greatest effect of adrenocortical extract is obtained when it is given simultaneously with the India ink. On the other hand, adrenalectomy resulted in pronounced enhancement of the spreading reaction. Of interest in this connection is the recent demonstration[17] that pituitary-adrenocortical hormones inhibit the Shwartzman phenomenon. It seems clear that adrenocortical function may play a profound role in resistance against invasions of the organism by toxic substances or organisms. It would appear that the adrenal glands are concerned in the maintenance of the tonus of the ground substance of the mesenchyme. This may be of significance in relation to certain of those clinical circumstances which appear to be ameliorated following ACTH or cortisone therapy.

In a discussion of the role of the adrenal glands in immunizing mechanisms, reference should be made to the hypersensitive state. This appears to be indicated particularly in view of the remarkable reports which are becoming available of the therapeutic effects of adrenocorticotropic hormone and potent adrenocortical steroids in diseases in which hypersensitivity may be an etiologic factor. The direct relationship of the adrenal cortex to one manifestation of the hypersensitive state, namely, anaphylaxis, has been established clearly. Normal mice and rats, which are exceedingly resistant to the induction of the anaphylaxis phenomenon, become highly susceptible following adrenalectomy.[12] The basis of the role of the adrenal cortex in the prevention of anaphylaxis is not yet clear. Elucidation of this mechanism will undoubtedly contribute to an understanding of the role of the adrenal cortex in the hypersensitive state in general.

A few comments should also be made in relation to the effect of pituitary-adrenocortical secretion in causing disappearance of blood eosinophils. In view of the eosinophilia in certain allergic states, and the eosinophilic infiltration into subcutaneous connective tissue, which occurs as a result of inflammation, it is of considerable interest that augmented pituitary-adrenocortical secretion results in pronounced diminution in the level of circulating blood eosinophils. The basis of this eosinopenia is still unexplained; it is not known whether it is due to a failure of production of these cells, to an increased rate of their removal by the tissues, or to an increased destruction of eosinophils. If it should be

observed that there is an increased infiltration of eosinophils into the connective tissues as a result of adrenocortical extract administration, as occurs during the acute inflammatory response, there would be established a connecting link between adrenal secretions and the allergic type of inflammatory reaction. However, there yet remains unexplained the nature of the mechanisms by which adrenocortical steroids ameliorate the hypersensitive state. Perhaps several speculations may be permitted at present, with the purpose chiefly of indicating possible further lines of investigation in this fundamentally important field. It would appear logical to suggest that pituitary-adrenocortical secretion may affect the antigen-antibody reaction, which is a preliminary to allergic inflammation; this action of the hormonal mechanism may be based on one or more of at least three processes: (1) An alteration in the relative concentrations of antigen and antibody in tissues, thus affecting their rate of interaction; (2) an alteration in tissue factors influencing the extent of combination of antigen and antibody, and (3) an alteration in the degree of production of tissue inflammatory substances released as a result of antigen-antibody reaction. It would at the moment seem paradoxical that the inflammatory response resulting from antigen-antibody reaction may be blocked by adrenocortical steroids, which also augment production of tissue antibody. This may indicate that the adrenocortical steroids are concerned with the inflammatory response in some manner other than that relating to the reaction of antigen with antibody. This consideration appears to favor at present the working hypothesis that the adrenocortical steroids block the tissue production of substances which are deleterious to cells and cause cellular injury, thus ameliorating the hypersensitive state.

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Care of the Neglected Burn Patient

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SUMMARY

In spite of widely dispersed modern knowledge of burn treatment, neglect or inept care of severely burned patients continues as a cause of a considerable medical problem. Since the neglected patient is usually emaciated, pain-ridden and low in morale, prompt attention to rehabilitation through blood transfusions, nourishment, relief of pain and cleansing of the wound is mandatory. Skin grafting as soon as possible is the aim.

PATIENTS who have been burned many months or even years before and are still unhealed are observed in the everyday practice of reconstructive surgery. Such patients are usually in an extremely debilitated condition and desperately ill. Heroic effort is necessary to help them to survive at all. Primary care of them may require several months and late reconstructive operations may extend over a period of years.

In many cases, the patient himself is responsible for the neglect of even severe burns. Religious fanaticism, ignorance, or a generally uncooperative attitude may have caused him to shun treatment. Also, feeble-minded, epileptic or insane persons may be burned severely yet not seek medical care.

All too often, however, errors on the part of physicians and nurses have created the gross physiological catastrophe which occurs with neglect of a severe burn. The commonest errors responsible for the condition of the patient include, from a general standpoint, a complete lack of understanding of the metabolism of patients with burns, the withholding of proper fluids and blood transfusions, neglect of diet and often the misuse or withholding of the various chemotherapeutic and antibiotic agents. The physician may be so hurried that he relegates the time-consuming dressings to the less experienced interns and residents or to nurses, orderlies and aides. In addition, because of the extremely high cost of care of a serious burn, all but the wealthiest patients are channeled to the larger wards where adequate care may be much more difficult.

Nursing errors and neglect are common. The patient who is weak and debilitated and scarcely able to feed himself, or the patient with severely burned hands, for example, may be denied proper nourishment because no one will take the time necessary to see that he gets an adequate diet. In addition to this, an extremely burned patient presents a difficult problem in morale. Because his dressings are malodorous and he cries and screams with pain when attempt is made to help him, he may be quickly classified by the attending nurses and doctors as "difficult" or "impossible," and neglect may ensue. Special nurses often refuse to attend patients with burns, thereby handicapping the physician, the patient and the nurses on general duty.

Ineptitude in the local care of the burned area is often responsible for the extremely poor morale of the patient and for much of the difficulty in taking care of him. The commonest error is the use of coarse-mesh gauze next to the granulating surfaces. This practice, which has been universally condemned by those caring for large numbers of patients with burns, results in the budding of granulations through the meshes of the dressings. Since removal of this gauze causes pain, bleeding and destruction of new epithelium, dressings are made less frequently than is desirable. Granulations then grow farther into the gauze. It is not uncommon to encounter patients who have been given general anesthesia every third or fourth day over a period of many weeks for change of dressings. The odor and general surgical uncleanliness of soiled dressings is offensive to the patient and results in decreased appetite. Irrigation of the dressings with saline, boric or mild Dakin's solution through catheters in the dressings does not compensate for needed change of dressings.

The local application of various burn dressings, oils, pastes, powders and other "cure-all" preparations has been advocated continuously since the time of Hippocrates. The very number of such therapeutic agents indicates that none of them has really settled the problem; one must turn, as always, to the basic physiological surgical principles of the care of any open wound.

Poor dressing technique is the rule rather than the exception in the care of extensive burns. Continual contamination and reinfection from the fingers and nose and throat of those who change or observe the dressings is all too frequent and a factor which considerably prolongs morbidity. In critical cases, such added infection may cause death.

The results of skin-grafts attempted by surgeons without particular training for the operation vary greatly in the degree of success. The commonest errors here are poor choice in type of skin-graft used and poor judgment in the amount of skin taken or in choosing the bed on which to apply the graft. The intact skin on a seriously burned patient is a very precious commodity upon which future function and even life itself will probably depend. To scar such an area and render it unfit for further use by such a crude method as "pinch-grafting" is certainly to be profoundly condemned (Figure 1).

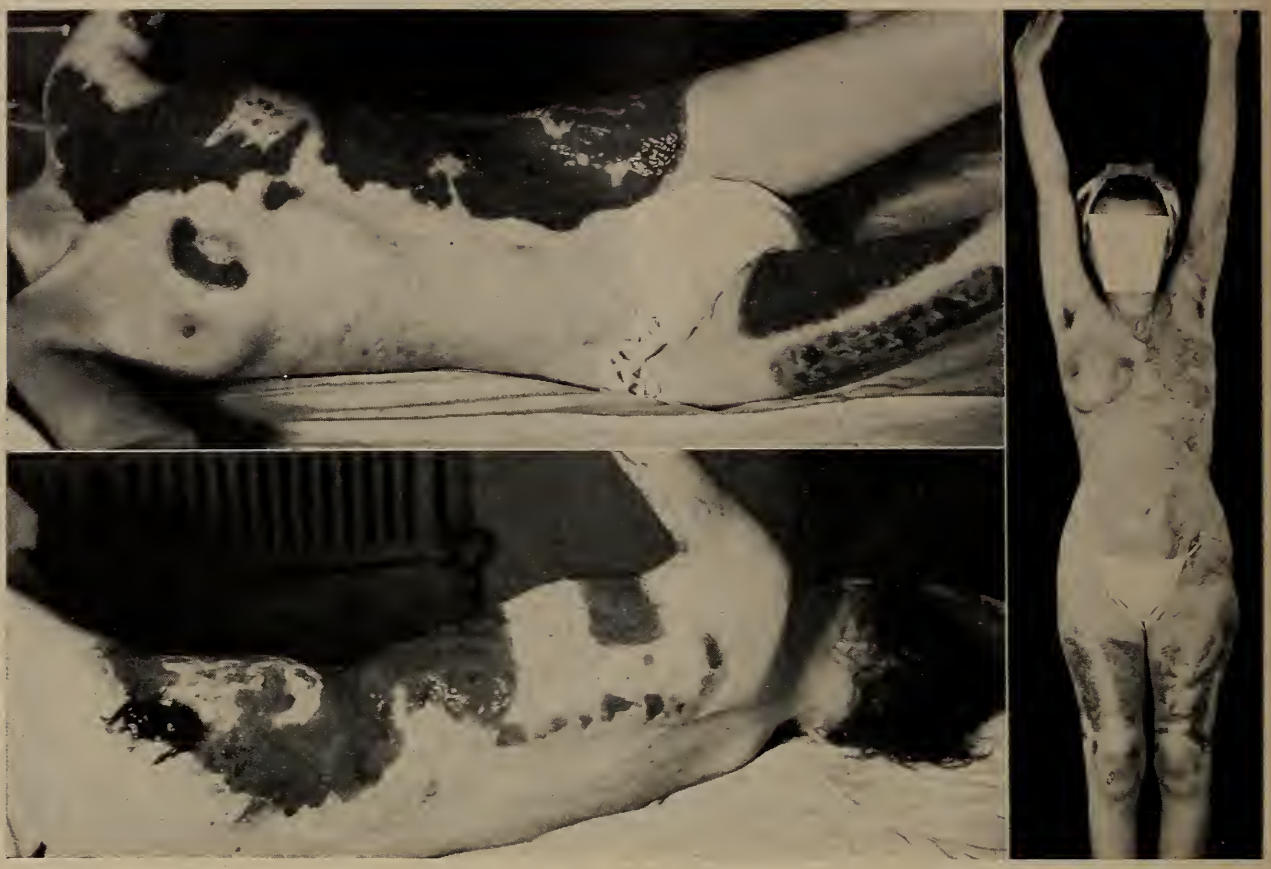

Figure 1.—*Upper left:* Burn occurred seven months before picture was taken. Destruction on thighs from too deep graft removal. Flank scarred by inept pinch-grafts and rendered unfit for future donor site. *Lower left:* Posterior view same patient. Note decubitus ulcers and wasting. *Right:* Same patient one year later. "Patch-grafts" were lifesaving in this instance.

Likewise, it is poor judgment to use the dermatome to take too many large sheets of skin and thus open an additional large surface area to bacterial contamination, oozing and drainage on a person who has already lost a considerable area of skin. This overzealous treatment may tip the scales unfavorably in the direction of failure and catastrophe. The risk of loss of such large sheets of skin, when applied as a continuous sheet on a dirty granulating surface, is considerable. If loss occurs it is tragic, for there may be no further chance to cover the burned areas with skin. When the burned area is relatively small, involving, say, one extremity or a large area on a flank, it is certainly desirable to cover the granulating surface with continuous sheets of skin. This practice by one familiar with the technique, who places the skin on a bed which is ready to receive it, results in the most prompt healing known for burns. On more extensive burns, however, it would be foolhardy to try to cover completely the granulating surfaces with continuous sheets of skin, since the amount of donor skin necessary might be so great as to be incompatible with survival (Figure 2). In such cases, the cutting of the thick-split sheet of skin-graft into smaller pieces and applying them in the "flag-stone" manner (Figures 1, 2 and 3) results in rapid clean-up of the infected areas. This plugs the life-sapping leak of important serum and plasma.

Indiscriminate use of the dermatome in inexperienced hands can have tragic results. On many patients, particularly children whose skin is thin, a graft is often taken so thick that there is no hope that re-epithelialization and healing can take place in the donor site (Figure 1). Thus, the already seriously burned patient has an additional area of third degree loss of skin.

CLINICAL CHARACTERISTICS

Fetor, the gauntness associated with chronic debilitating disease, stiffness of the joints, poor morale, fever, anemia and anorexia—these are clinical conditions typical of the patient with neglected severe burns. Such a patient may cry out if a gesture is made toward the burned area. Available donor sites for skin are usually exceedingly scanty due to the wasting of the skin and subcutaneous tissues and often to previous ill-fated skin-grafting. Contractures may have caused ectropion, elevated alae of the nose, chondritis and crumpling of the ears, and contractures about the lips and around the joints of the extremities. These contractures limit movement. Decubitus ulcers are exceedingly common. Granulations are usually pale and often dirty and boggy. Superficial venous thromboses are not uncommon in the extremities, with edema of hands and feet due to faulty venous and lymphatic return flow and to hypoproteinemia.

Figure 2.—*Left:* Flank and thigh severely burned four months before this picture. Donor areas very scarce. *Right:* Two months and 24 days later. Entirely healed by "patch-grafting." Later release of scar and recovering of areas can be performed with continuous sheets of skin on a sterile recipient area and on a well patient instead of a debilitated one.

Such patients are often already addicted to morphine. Their appetite is exceedingly poor and they have lost the will to live. They continually find fault with everything around them. They have usually found a position in which they are the least uncomfortable and they stick fanatically to this one position, trying not to move for fear of hurting themselves. Laboratory studies show extreme degrees of anemia and hypoproteinemia. Although blood levels of vitamins and of hormones are not ordinarily measured, levels undoubtedly would be found to be greatly below normal values.

TREATMENT

The general care of patients with neglected burns can be summarized as providing adequate nutrition and good morale. If nutrition is adequate, good morale normally follows. Transfusion with rather large amounts of whole blood has been found to be the most effective single method for restoration. An initial transfusion of 1,000 cc. of whole citrated blood in an adult is usually followed by daily transfusions of 500 cc. until the patient is ready for skin-grafting ten days to two weeks after the time of first examination. As skin-grafting is completed and the open surface areas diminish, the amount of blood is correspondingly diminished but is kept up so that a sustained high level of blood proteins and of hemoglobin is maintained. In addition, of course, the antibodies and other factors carried in the donor blood are of value to the patient. In a recent case, 55 consecutive blood transfusions were necessary before grafting was completed and the patient restored to a completely epithelialized and balanced state. The patient had appeared moribund when first observed.

As blood transfusions are only a crutch to be used until the body can again supply its own proteins and hemoglobin, adequate diet is a major factor in restoration. A diet high in proteins, vitamins and calories (4,000 to 4,500 daily) is essential. If appetite lags so that adequate dietary intake is impossible, gavage may be necessary. Dietary stimulants are of considerable help but they are of little value until the patient has been given enough blood by transfusion to permit a beginning of return to normal processes. Large doses of vitamins will do more than any other one factor to stimulate appetite, but the use of alcoholic beverages should not be overlooked. Beer, ale, stout, cocktails and highballs all have their place in stimulating appetite. Beer is used with great success in children, who rapidly learn to like its flavor. Having a bottle of beer before lunch and before dinner will often stimulate them to eat a good meal. Although a great deal of work has been done on the use of artificial proteins (amino-acids) intravenously, there is no substitute for the autogenic manufacture of proteins and amino-acids by the body itself through the alimentary tract. All dietary supplements can and should be used, however, until normal consumption of food is resumed.

Dressings on the burned areas must be soothing and must be such as to give egress to the excretory products of the granulating surfaces. At the first dressing, the patient is put into a bathtub, dressings and all, and allowed to soak in normal saline so that the removal of dressings is relatively painless (Figure 3). The use of a gallon of 2 per cent Dakin's solution in such a tubful of water has also been found to be of definite value in hastening the clean-up of granulating surfaces.

Following removal of the dressings in the tub of normal saline, the burned area is redressed with fine-mesh gauze which has been impregnated with a paraffin and vaseline mixture known as "parawax." The mixture is approximately two parts of vaseline to one part of paraffin and is waxy in consistency so that it does not macerate new epithelium. As it does not become oily and soak into the dressings, the surface lubricating effect is not lost as often happens in the case of vaseline gauze.

The patient is kept in bed with parawax gauze dressings in place until the following day. He is then placed in the tub again and while he is there the dressings are removed and fresh dressings applied. In addition, exercise of joints is carried out in the tub, lessening the period of later rehabilitation. Because of the factor of bacterial contaminants in the tub, spikes of fever following the first few days of tubbing are not unusual. The temperature-regulating mechanism of burn patients is considerably

Figure 3.—*Upper left:* Tubbing an extensively burned patient in normal saline. Painless change of dressings with patient in tub greatly aids morale and appetite. *Lower left:* Same patient several weeks after burns have been covered by "patch-graft" technique. *Right:* Six months later. Note excellent nutrition and range of motion of arms and legs.

distorted by destruction of sweat glands over large surfaces of the body and by the presence of large dressings which prevent normal evaporation and cooling. Alcohol rubs, ice compresses to the head, cool water enemas, etc., are indicated if temperature spikes rise too high.

All of the procedures for the local and general care of the severely burned patient are directed toward one point—the application of skin-grafts to the denuded areas as soon as possible. Since thin, wasted extremities and bony trunk areas offer only small amounts of skin for grafting purposes, economy of skin dictates the use of the previously mentioned "patch-grafting" technique if the burn is extensive. Application of continuous sheets of skin is the method of choice for smaller burns.

Improvement in morale and appetite usually follows within a few days of skin-grafting. Additional grafting is carried out as soon as new areas are cleaned up and ready.

In extensive burns where patch-grafting techniques are used, some contractures are inevitable. The release of these contractures represents a much less formidable plastic surgical procedure at a late period when the patient's metabolism is normal and he is once again healthy.

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Comparative Concurrent Results of Vagotomy Procedures, Conventional Gastric Resection and Hemigastrectomy with Subtotal Vagotomy

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SUMMARY

The question of the best surgical treatment of duodenal ulcer remains unanswered.

In a series of 132 patients, results following gastric resection and hemigastrectomy with subtotal vagotomy were better than those following vagotomy procedures alone.

INTEREST in the surgical treatment of duodenal ulcer has been stimulated by the recent introduction of vagotomy by Dragstedt[2, 3, 4] and co-workers. This procedure and gastric resection constitute the two currently popular methods of surgical treatment of this lesion. Gastric resection, including removal of at least three-fifths of the stomach and the ulcer-bearing portion of the duodenum, has stood the test of time as well as or better than other surgical procedures heretofore used.

The present study is based upon surgical treatment in 132 cases of duodenal ulcer. The postoperative follow-up period was approximately two years. Three types of operation were used concurrently during the period covered by the study. In 43 cases so-called complete vagotomy was used, with or without supplemental gastroenterostomy; in 47 cases the operation was conventional gastric resection; in 42 the procedure was hemigastrectomy and so-called subtotal vagotomy as recently described by Stevens.[9]

Of the three operative procedures studied in this series, vagotomy is the simplest to perform, but it has certain disadvantages, two of which appear to be of major importance: It attacks the nervous factor and not the hormonal factor apparently involved in the secretion of gastric acid, and impairment of emptying of the stomach occurs in an appreciable percentage of cases.

Gastric resection has had a longer test of time than has vagotomy, but its disadvantages are that it attacks the hormonal factor but not the nervous factor, and that it is a more destructive surgical procedure.

The purpose of hemigastrectomy with subtotal vagotomy, as used in the third group in this study, is to attack both the hormonal and nervous phases of the secretion of gastric acid. At the same time it was hoped that impairment of the emptying of the stomach could be avoided by leaving some vagus fibers intact. The destructiveness of conventional gastric resection is lessened by removing only half of the stomach.

This procedure was carried out with the full realization that the consensus is that partial vagotomy alone is not effective in eradicating duodenal ulcer. However, it was hoped that a combination of these procedures might prove at least as effective as the more radical conventional gastric resection. If this proves to be the case, it would have the advantage of being a less mutilating procedure, and possibly the occasional incidence of weight loss and anemia following the more radical gastric resection would be decreased.

Furthermore, in this connection, Aaron and co-workers,[1] quoting from a panel discussion at a meeting of the American Gastroenterological Association,[13] stated that "the opinion that transthoracic or transabdominal vagotomy as usually performed is seldom complete is concurred in by all modern physiologists," and further that "complete vagotomy in experimental animals regularly causes digestive disturbances severe enough to cause death." Anatomic evidence of vagus fibers traversing the esophageal musculature, of small esophageal plexuses which may readily escape notice, and of ganglionic plexuses within the walls of the stomach is also cited to strengthen the belief that vagotomy as performed clinically is seldom complete.

Technically, subtotal vagotomy, as carried out in the series here reviewed, is simple. The vagus fibers are divided approximately one inch below the gastroesophageal junction on the lesser curvature of the stomach. The division is made after a mass ligation which includes the left gastric artery. Figure 1 is a diagrammatic illustration of photographs of the excellent anatomical dissections made by Dragstedt and co-workers.[5] It shows that practically all fibers of both vagus nerves accumulate between the lesser curvature of the stomach and the left gastric artery before they enter the stomach.

This procedure differs from the partial vagotomy reported by Winkelstein and Berg[12] who used an-

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TABLE 1.

Operation	No. of Cases	Postoperative Clinical Results: Good	Unsatisfactory	Marginal Ulcer	Mortality
1. Vagotomy procedures	43	33 (78%)	10 (22%)	3 (Insulin test negative in 2)	1
2. Conventional resection	47	42 (90%)	5 (10%)	1	0
3. Hemigastrectomy and subtotal vagotomy	42	38 (90%)	4 (10%)	1	0
Total	132				

TABLE 2.—*Gastric Acidity*

Type of Operation	Preoperative: Night Secretion	Histamine	Insulin	Postoperative: Night Secretion	Histamine	Insulin
1. Vagotomy						
a. Alone	700cc./20°	66.6°	83.7°	247cc./10.5°	51°	13°
b. With gastroenterostomy	777cc./37°	52.4°	64°	530cc./2°	45°	13.8°
2. Conventional resection	808cc./29°	60°	62°	400cc./3.5°	18°	14.5°
3. Hemigastrectomy and subtotal vagotomy	746cc./52.5°	65.5°	74°	181cc./5°	25.3°	18.3°

terior (left) vagotomy. So-called "partial vagus resection" has also been attempted by Moore,[8] who divided the left vagus and only the gastric branches of the right vagus nerve. This was unsuccessful in preventing the unfavorable side effects of vagotomy, but Moore concluded that "variations in procedure which may produce protection against ulcer without incurring side effects should be further studied."

RESULTS

Results of the present study are shown in Tables 1, 2 and 3.

TABLE 3.—*X-Ray Studies*

Type of Operation	No. Cases Studied	Retention After 6 Hrs.	Per Cent Incidence
1. Vagotomy			
a. Alone	10	7	70%
b. With gastroenterostomy	12	2	17%
	22	9	41%
2. Conventional resection	33	0	0
3. Hemigastrectomy and subtotal vagotomy	38	0	0

COMMENT

Good clinical results following adequate gastric resection alone and following hemigastrectomy with subtotal vagotomy were the same (90 per cent). Good results following vagotomy with or without gastroenterostomy were relatively fewer (78 per cent). This coincides with the report of Walters[11] of good results in 79 per cent of cases following vagotomy procedures.

There were no deaths following gastric resection or hemigastrectomy with subtotal vagotomy. There was one operative fatality (from perforation of the esophagus) following vagotomy.

Stomal ulcers occurred in one patient following gastric resection, in one following hemigastrectomy with subtotal vagotomy, and in three following vagotomy and gastroenterostomy. The stomal ulcer that occurred following gastric resection healed and remained healed six months or more following supradiaphragmatic vagotomy. In the cases in which marginal ulcers developed following vagotomy and gastroenterostomy, the lesions likewise healed and remained well six months or more after operation to destroy the gastroenterostomy and carry out adequate gastric resection.

Griswold[6] suggested preoperative determination as to which patients with duodenal ulcer will respond best to gastric resection and which best to vagotomy. The acidity studies in this series (Table 2) may be helpful in making such a selection.

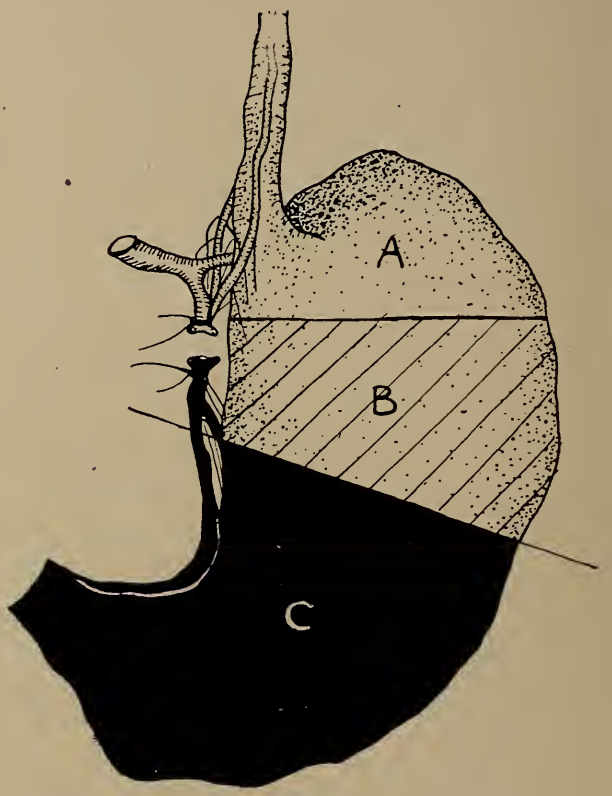

Figure 1.—Division of the accumulation of the fibers of both vagus nerves between the lesser curvature of the stomach and the left gastric artery is shown. A—Vagus nerve fibers intact. B—Denervated portion of remaining stomach after hemigastrectomy. C—Portion of stomach removed.

Histamine-induced secretion of gastric acids is greatly reduced following adequate gastric resection and following hemigastrectomy with partial vagotomy, whereas this effect is relatively minimal following vagotomy.

If this factor alone were considered, an opinion that at least those patients with a high acid secretory response to histamine should be treated by gastrectomy might be warranted. It has been suggested (Stevens and Kipen[10]) that this principle may apply in the selection of patients with post-gastroenterostomy marginal ulcer for surgical treatment, on the basis that in those cases in which there is a high histamine response, the hormonal factor, which is best treated by resection, is predominant.

Data on night secretion and insulin acidity values are not helpful, as the data are essentially the same following vagotomy as they are after resection procedures.

An effort was made to evaluate the influence of the alkaline duodenal content in gastrectomized patients in order to account for the similarity of insulin test results in gastrectomized patients to the results in vagotomized patients. Some gross studies were made to determine the bile content of the stomach following gastrectomy. The results were not consistent since the hydrochloric acid figures following insulin hypoglycemia were, on the whole, as low when no bile was found in the gastric contents as when bile was present.

Identical studies of gastric retention were made approximately two years following the three types of operations. The same measured amount of barium that was ingested preoperatively was used for x-ray studies included in this report. In patients who had undergone gastric resection and hemigastrectomy and in those who had had partial vagotomy there was no instance of retention. Seventy per cent of patients who had had vagotomy alone had six- to 24-hour retention. The incidence of retention after gastroenterostomy and vagotomy was 17 per cent.

The incidence of retention two years following vagotomy procedures is somewhat less than that reported for the same series (Kipen and Stevens[7]) one year after vagotomy. The reason for this is not clear. It might be postulated that some compensation occurs, as time progresses, through vagus fibers remaining in the esophageal wall and in esophageal plexuses which escaped detection when vagotomy was done.

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Indications for Different Approaches to Prostatectomy

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SUMMARY

Most urologists are definite and positive in their conviction as to which approach to prostatectomy is indicated in a given case. Their views are often so widely divergent that other physicians may be confused as to the best advice to give patients who need prostatic operation. Urologists who extol one approach or technique and deride another only add to the confusion and prejudice.

The most important indication for the use of any approach or technique is the ability of the surgeon to carry it out.

MUCH has been written and said about the advantages and also the dangers of the different approaches to prostatectomy. The stated indications for the use of the suprapubic, the transurethral, or the perineal approach, with modifications of each, vary widely among different surgeons. Undoubtedly this has resulted in confusion in the minds of many physicians who are not urologists. The referring physician may not be sure as to which operation he should advise the patient to have, or the patient himself may have decided upon an approach which is not applicable in his case or which the surgeon who is to operate is not prepared to carry out.

Most urologists, however, are agreed upon the following few points: (1) The classical suprapubic approach is the easiest to learn and to perform. (2) The transurethral is the most difficult to learn and to perform correctly. (3) The perineal results in sexual impotence more frequently than does either of the other two approaches. (4) In most cases of median bar, bladder neck contracture and prostatic carcinoma which are obstructing urinary outflow, the transurethral approach should be used if the surgeon has had training in this method. (5) Removal of a greatly enlarged prostate gland, a relatively rare condition, should not be attempted transurethrally.

Some of the more commonly proclaimed indications for the different methods are: (1) If there is intravesical enlargement, the suprapubic approach should be used. (2) In cases of intra-urethral hypertrophy, the perineal approach is more suitable. (3) For removal of small glands, the endoscopic route is best. These indications might be acceptable to the surgeon who is as competent in one method as in another. Every well trained urologist should be familiar with the different techniques and be able to employ at least one technique of each approach. However, even though he does use all three approaches in accord with his beliefs as to indications for them, the surgeon undoubtedly has had more training and experience in, and is himself better adapted to carry out, one procedure than the others.

Some of the more controversial advantages of each approach and technique, as proclaimed by the enthusiast, are that the operation of his choice (1) results in less shock, less hemorrhage and fewer immediate complications than the others, (2) permits of a more complete removal of the gland, (3) requires shorter hospitalization, (4) is followed by less infection and less postoperative morbidity, and (5) gives final results that are better with a lower incidence of recurrence of obstruction. When a surgeon claims these advantages for the method he uses, it is undoubtedly true that when he performs the operation by the method of his choice he obtains better results by that method than he does by using a different approach. But another surgeon, equally skillful, experienced and honest, may claim the same advantages for quite another method and technique.

It has been repeatedly stated that the surgeon should fit his method of approach to the type of bladder neck obstruction his patient has. This dictum, however, is applicable only to a limited extent, for the indications followed by one surgeon for the use of a certain approach might be entirely different from those followed by others of different training, experience, ability, and temperament. Therefore, the most important indication for any method or technique of prostatectomy is the experience and ability of the surgeon who is to perform the operation, and he himself knows these better than anyone else.

The excessive praise of one approach to prostatectomy and condemnation of a different procedure causes other physicians, and also sometimes patients, to become prejudiced against one or more methods or techniques. It is difficult for the operating surgeon to exercise his best judgment in deciding upon which approach to use in a given case, when pressure for one method over another is exerted by the referring physician or by the patient.

All approaches to prostatectomy and most of the variations of technique of each, when performed correctly, are good and lead to successful end results in the majority of cases. Conversely, when the operation is incorrectly performed, no matter what method is used, immediate complications occur more frequently, the morbidity is greater, and the end results poorer. Every surgeon knows or should know which operation is indicated for him to do in a given case. Having the best interest of his patient at heart, and not allowing himself to be unduly influenced by the referring physician or by the patient or his friends, he will advise the kind of prostatectomy which, when performed by him, gives the best results.

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Atopic Dermatitis—Etiology and Clinical Management

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SUMMARY

Atopic dermatitis is primarily an allergic problem, similar in most of its aspects to that of allergic bronchial asthma. It should be studied and treated like asthma, with especial emphasis on the significance of inhalant allergens. It is doubtful that psychic factors are of importance in primary genesis of the disease although they may be involved in exacerbation of it.

FEW allergic conditions seem to be so difficult of management as is atopic dermatitis, also known as allergic eczema. Formerly considered a strictly dermatologic problem, it was included in the dermatologic scrapheap of eczemas and treated as such. In the absence of other explanations as to the cause of the disease, psychogenic factors often were considered paramount, as indicated by the designation of neurodermatitis. Beginning in 1932, however, through the efforts of Sulzberger, Hill, and others, the relationship of this condition to allergic reaction was clearly established. The evidence was the frequent association or alternation of atopic dermatitis with asthma or hay fever, the high incidence of family history of allergic sensitivity, the frequency of associated eosinophilia, the frequent occurrence of positive reaction to skin tests with food and inhalant allergens, and the clinical demonstration of the specific etiologic relationship of some allergens, notably foods, to the dermatitis.

Upon the basis of this evidence, Sulzberger and Coca[8] designated this condition as *atopic dermatitis* to indicate an inflammatory condition of the skin appearing in an individual who was, by virtue of heredity, predisposed to specific sensitization. According to these criteria, then, atopic dermatitis may be described as an acute, subacute or more often inflammatory disease of the skin involving especially the flexures and characterized by intense itching, papulation, thickening and lichenification of the involved areas. It is associated with specific sensitizations to "protein allergens" responsible for the development of characteristic forms of clinical disease in an atopic patient.

Following these reports, numerous and definite demonstrations of the allergic character of this condition were offered. The etiologic relationship of allergic reaction to foods, especially in infants and young children, was definitely established by Hill[4] and others. But as the patients were studied further, it soon became evident that this was not true for older children and adults; also that elimination of foods giving specific positive skin tests and even demonstrable circulating antibodies or reagins often failed to relieve the condition. This naturally has led to considerable skepticism as to the value of skin tests in atopic dermatitis. It also has invoked the consideration of other possible etiologic factors, notably psychogenic or infectious causes, recalling the era before 1932 when the disease was considered strictly a dermatologic problem to be treated by local applications, by non-specific therapy or by psychogenic means. No wonder many practitioners have been discouraged about treating patients with the disease. This discouragement is shared not only by general practitioners, pediatricians and dermatologists, but even by many prominent allergists. Thus for example, Cooke[2] in a recent monograph stated, "Evidence is also present for my belief that allergens producing only wheal reactions do not cause dermatitis and therefore skin testing for immediate wheal reactions is not a correct procedure for an etiologic diagnosis of these exudative skin lesions." It is not surprising, therefore, that many allergists and dermatologists are so confused as to the cause of this disease, the value of skin tests and especially as to the clinical management of patients. Fortunately, this has been contrary to the author's experience.

One of the chief reasons for this confusion appears to be the assumption that food allergens are the most important causative agents. Hence, when the elimination of foods to which the patient had positive reaction did not relieve the condition, it was assumed that skin tests were valueless. For some unknown reason, little or no attention has been given to the importance of inhalant allergens, even though many allergists, including Sulzberger, Feinberg, Figley, Rowe and others, have shown an etiological relationship between such allergens as house dust, silk, flour, horse dander and pollen and atopic dermatitis in susceptible patients. In order to further emphasize the significance of this relationship, the author recently reported[10] the results of a study of 54 patients with atopic dermatitis. Upon the basis of clinical and skin test evidence, this study showed that house dust, pollens (especially ragweed) and wool are outstanding inhalant offenders and that other inhalants like atmospheric molds, animals danders, silk, cooking odors, etc., likewise are prom-

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inent offenders. In many of the patients included in that series, a correlation between the specific inhalant to which there was a positive skin reaction and the patient's outbreaks could be obtained. Thus for example, some patients noted increase in itching of the skin after contact with dust. In other instances dust-sensitive patients were relieved by environmental change either to the hospital or seashore. In the latter group, dust desensitization properly carried out was followed by relief. Similar clinical and skin-test evidence emphasized the etiologic relationship of other inhalant allergens to atopic dermatitis.

While all this evidence suggests of course that inhalant allergens are important in atopic dermatitis, it still is purely clinical and open to questionable interpretation. However, the author and his associates[11] have been able to obtain more convincing proof in an experimental clinical study which was recently reported at the meeting of the American Academy of Allergy. In the latter study, atopic dermatitis was induced, apparently for the first time, by inhalation of the offending dust and mold allergens as well as by injection of the specific house dust extract. The study also evoked evidence that the reaction apparently is mediated through the sweating mechanism.

With this demonstration of the causal relationship of inhalant allergens, it becomes evident that in atopic dermatitis as in asthma both inhalant and food allergens can be etiologically significant.

Actually, there should be no surprise that inhalants are important in atopic dermatitis, especially in older children. That there is a close resemblance between atopic dermatitis and allergic bronchial asthma has been emphasized repeatedly by many investigators.[8] Those two conditions have so many characteristics in common, with regard to etiologic factors, diagnosis and treatment, that atopic dermatitis has properly been designated "asthma of the skin." Both conditions frequently coexist or alternate in the same patient. Atopic dermatitis in infancy often is supplanted by asthma of childhood or later life and vice versa. As in asthma, patients with atopic dermatitis are often worse in the winter and especially at the times of seasonal change from summer to fall and from winter to spring. Positive skin reactions are obtained in about the same proportion in both conditions and have about the same clinical significance. Sensitivity to foods is admittedly most important, not only in asthma of infants and young children but also in atopic dermatitis. Likewise, inhalant allergens are more prominent than foods in asthma affecting older children and adults; yet, strangely, the same reasoning has not been applied similarly to its counterpart in the skin.

As in asthma, not all inhalant allergens are equally significant as causal agents. The exact incidence is difficult to ascertain because most of the statistical data depend on skin test evidence. Nevertheless, in addition to the frequency of positive skin reactions, clinical experience also indicated that house dust is a prominent etiologic factor. Thus, for example, some patients will complain of increased itching after dusting; also in asthma, removal of the patient to another environment will be followed by relief. To illustrate:

CASE REPORT

CASE 1: The patient, a girl, aged 16, had flexural atopic dermatitis, recurrent since infancy, and was only symptomatically relieved by the usual local dermatologic management. Allergic study showed positive reactions to dust, wool, pollens, and some foods. The patient was always improved while at the seashore in the summer. This was attributed to the beneficial effect of the sun's rays. She was always worse in early fall and winter months. She was asked to go to the seashore in the spring and upon returning to go not to her own home but to the home of a relative in the same neighborhood. The skin condition cleared up at the seashore and did not recur even in the home of the relative, but it became worse within a day or two after she returned to her own home. Institution of proper dust precautions and desensitization with an autogenous house dust extract in addition to pollen therapy has been followed by pronounced improvement which has persisted for more than three years. It was subsequently determined by clinical trial that none of the foods for which there was positive reaction, with the possible exception of chocolate, were of etiological significance.

Question may arise as to whether, in these patients, the dust excitant acts by inhalation or by direct contact. Since in most patients the lesions involve the flexures, which usually are covered, it is unlikely that the dust will have a chance to act directly, but rather that it operates by inhalation. But if a sufficient amount of dust does come into direct contact with the skin, it can cause difficulty. This was demonstrated clearly in a patient with hay fever and other allergic manifestations who observed that when the house dust present on a dust rag was in direct contact with her skin, it caused pronounced itching. When the dust was inhaled, she first would sneeze or wheeze, and if this reaction was intense, itching of the affected skin would follow. Strict avoidance of contact with dust coupled with injections of the extract has enabled this patient to remain free of dermatitis for more than six years.

Further proof of the importance of inhalation of dust was obtained in the experimental study already mentioned when dermatitis was induced after inhalation of the dust by the patient. It would seem, therefore, that house dust probably is just as important an allergen in atopic dermatitis as in asthma.

Allergy to pollens likewise is an important cause of atopic dermatitis but is apparently neglected in the consideration of the causes of the disease despite reports by Cazort,[1] Feinberg,[3] Rowe[5] and others. There were few of the patients observed by the author who did not have positive reaction to pollen, notably ragweed. In some, the positive pollen reaction can be explained by concomitant hay fever or by a family history of hay fever, and in such instances it has no etiologic relationship to the skin condition. But in many others, it is definitely causal and may induce pronounced aggravation during the season, as for example in the following case:

CASE REPORT

CASE 2: A male, aged 35, was observed in March 1945 with pronounced generalized atopic dermatitis of two years' duration and a history of seasonal hay fever and asthma since the age of nine; also occasional migraine and urticaria occurred and there was a history of hay fever in the father. With the onset of the skin condition in July 1943, there was very little hay fever or asthma—in fact during 1944 only one day of hay fever and asthma. But during August and September 1944, atopic dermatitis was so severe as to require hospitalization for a month with little relief until the hay fever season was over. This experience was so bad that the patient dreaded the approach of another season. Intracutaneous skin tests showed pronounced positive reactions to ragweed pollen and house dust and in lesser degree to other inhalants and foods. Ragweed and dust desensitization was instituted with beneficial results which were still in effect when the patient was last observed in August 1945.

This case report clearly suggests the possible etiologic relationship between sensitivity to pollens and atopic dermatitis. Thus the hay fever and asthma present for many years were replaced almost completely by the dermatitis which was greatly aggravated by the ragweed sensitivity. When the ragweed season was over, the dermatitis was prolonged and became perennial from the same factors, inhalant or otherwise, which operate in perennial asthma secondary to seasonal hay fever.

This tendency for alternation—that is, for one allergic condition to be replaced by another at various times of life—is characteristic of the so-called hay fever-eczema (atopic dermatitis) group of patients, and has been noted by Brocq and many early observers. Sometimes, however, mild outbreaks of the dermatitis appear during the pollinating season, as for example, in the following case report:

CASE REPORT

CASE 3: The patient, a girl five years of age, was first observed at the age of two with atopic dermatitis present since infancy. The parents were told by a pediatrician that the child would grow out of it and only local applications were prescribed. The family history was strongly positive for allergic sensitivity. Positive skin reactions were obtained to house dust, wool, ragweed, milk and a few other foods. The condition was greatly improved by eliminating milk and wool; also by minimizing house dust contact and seashore environment. When first observed the patient had no hay fever symptoms nor was there any flare-up during the ragweed season despite a definite positive skin reaction. But when she was five years of age, while at the seashore in August, she had mild hay fever symptoms which were accompanied by a mild outbreak of atopic dermatitis in the flexures and on the face.

In this case, despite the elimination of the offending allergens from the diet and although the patient was in an environment where she previously had been well, both the dermatitis and hay fever symptoms appeared simultaneously, apparently from inhalation of ragweed pollen. Skin sensitivity to the latter had manifested itself at the age of two, antedating the clinical sensitivity which did not show itself until three years later. This is a good example of a positive skin reaction which represented future or potential clinical sensitivity.

Appreciation of the possible role of pollen sensitivity in atopic dermatitis therefore is essential to the proper management of patients with the disease. Where a possible causal relationship can be established by history or skin test findings or both, pollen desensitization has been definitely beneficial. In the absence of definite history of seasonal aggravation but with positive skin reactions to pollens, it is difficult to decide whether pollen therapy is advisable. If the patient has a positive family history of hay fever or very mild nasal symptoms, the author believes that pollen therapy may be valuable from a prophylactic standpoint even if the pollen sensitivity has no bearing on the skin condition. This opinion is not shared by other allergists.

Sensitivity to atmospheric molds also may be an important etiologic factor in atopic dermatitis, but it is unlikely to be of much significance in the eastern area since the incidence of mold allergy in hay fever or asthma is low there (about 5 per cent) compared with other regions, notably the Middle West. In a series reported by the author, about 15 per cent of the patients with positive reactions to pollens also reacted in slight degree to such molds as alternaria and hormodendrum, but no definite etiologic relationship could be established in that group. However, in the previously mentioned experimental study, atopic dermatitis was induced by the inhalation of alternaria, proving an etiologic relationship.

Sensitivity to animal danders also may be important in atopic dermatitis, but, as in asthma, the exact incidence is difficult to estimate. Thus, many patients have slight or moderately positive skin reactions to feather extract, but it is not always easy to decide whether such reactions were clinically important, first because feather extracts often give non-specific positive reactions and also because clinical relationship could not be easily proved. The patients who have such a reaction probably do not inhale enough feather allergen to produce atopic skin manifestations; nevertheless, sensitivity to feathers may be an additional excitant. Horse, rabbit, cat and dog danders are not prominent causes of atopic dermatitis, probably because of lessened opportunity for contact. Only about 10 per cent of the patients studied had positive skin reactions to extracts of these danders; however, several patients noted definite itching of the affected skin areas or new outbreaks when they were near a cat, dog, rabbit, or horse, even though not in direct contact with the animal. In at least three patients improvement in the skin condition seemed to follow removal of cats to whose dander they had positive reaction. As in asthma, skin tests with extracts of cat, dog, horse or rabbit epithelium are quite specific. When such reactions are present in a patient with atopic dermatitis, diligent search should be made for possible sources of contact.

The importance of wool as an etiologic factor in atopic dermatitis is unquestioned. But whether wool acts as an inhalant or as a contact allergen, or whether it causes aggravation by non-specific irri-

tation, is not always easy to determine. Of the 49 patients studied, 18 stated clearly that itching followed when wool was brought into contact with the skin lesions or even with the normal skin. Undoubtedly, in some of these patients direct contact action is operative and not all of it is due to specific allergic sensitivity. Nevertheless, many patients showed definite improvement when the woolen articles of clothing or bedding were removed completely. Since such articles are not always in direct contact with the lesions of dermatitis, it may be assumed that some of the wool allergen entered the circulation after being inhaled. As with feather extracts, skin tests with wool extract may be non-specific. Thus while 34 of the 49 patients tested had slight to moderate positive reaction, some of the reactions probably were non-specific. A striking instance of wool sensitivity is illustrated in the following case report:

CASE REPORT

CASE 4: A woman 82 years of age was first observed in the hospital with an acute flare-up of generalized dermatitis of the atopic type of several years' duration. Prior to admission the patient had been hospitalized in another institution and was greatly improved until shortly after discharge when, while out on a sun-porch in Atlantic City, she was wrapped in a woolen blanket. This was followed almost immediately by an acute flare-up which again required hospitalization. The patient had eosinophilia (17 per cent) and the family history was positive for atopic dermatitis. Reactions to intracutaneous skin tests were positive for house dust, wool, chocolate and tomato. The patient was greatly improved following the stay in the hospital. She was given instructions regarding avoidance of wool and house dust, but despite this, mild aggravation of the skin condition occurred, due to contact with wool and house dust.

A similar situation exists in relation to silk. Patients with atopic dermatitis may show positive skin reaction to this allergen. Thus 18 of 49 patients tested showed positive skin reaction; in four the reaction was moderate or pronounced. None of these patients apparently noted any evidence of clinical sensitivity, although this is not easy to detect. However, as previously mentioned, evidence that silk can be responsible for aggravation of symptoms in patients with atopic dermatitis has been furnished previously; while it had been believed that, as with wool, the reaction is provoked by direct contact of the silk with the patient's skin, the experiments of Sulzberger and Vaughan[9] conclusively demonstrated that silk protein when inhaled is absorbed into the circulation and thus can aggravate or induce the lesions of atopic dermatitis. It is not always possible to determine in a silk-sensitive patient which route is culpable. Reactions to patch tests frequently are negative, but this does not exclude possible contactant action. Regardless of the method of action, it is advisable for patients with positive reaction to silk to remove all possible sources of silk contact.

Other inhalant allergens like orris root, tobacco, insecticides, goat hair, cereal flours, etc., are possible but infrequent causes of atopic dermatitis. Thus for example, occasional instances have been reported of atopic dermatitis secondary to inhalation of cereal flours, especially in bakers, but these are the exception rather than the rule. Even the inhalation of the odors of cooking, especially of fish, or of perfume may cause aggravation in some patients. Interest again has been revived in the possibility that sensitivity to human dander is a causative factor in atopic dermatitis, especially in infancy. Allergic reaction to human dander was first described in 1925 by Van Leeweun[12] who considered it important in bronchial asthma. But this was never clearly proved and the subject was dropped. Recently Simon[7] reported positive skin reactions to human dander and positive results of passive transfer tests in infants with atopic dermatitis. He postulated that in such instances the human dander present in the scalp of the mother or father may aggravate the lesion either by direct contact with the skin or as a result of inhalation. No definite etiologic relationship has been established as yet between the dermatitis and sensitivity to human dander.

As previously mentioned, allergic sensitivity to food long has been considered the major etiologic agent in atopic dermatitis, probably because the sensitization is hematogenous and food allergens are known to be absorbed into the blood after ingestion. As early as 1915, Schloss[6] attributed infantile eczema to such foods as eggs, milk and cereals. His observation subsequently was corroborated by many others and especially by Hill[4] who showed that in young children with atopic dermatitis, removal of allergenic foods, particularly eggs, from the diet was followed by pronounced improvement or even cure, and that reintroduction of them into the diet brought about a recurrence. There is little question, then, that food sensitivity is important in infants and young children. It is only in older children and adults that its significance has been doubted, and, as already has been emphasized, this is explained by a failure to consider the inhalant allergens in the older age groups. This does not mean that food sensitivity is of no importance in older children or adults. It bears the same relationship as in asthma, where elimination of foods to which there is specific reaction is followed by relief and the reintroduction of them by aggravation. The author has found this as true with regard to adult patients with atopic dermatitis as it is to those with asthma.

The specific food allergens most frequently responsible for atopic dermatitis are well known. Egg is especially prominent. Sensitivity to egg should be suspect in all cases of atopic dermatitis even when the reaction to a skin test is negative.

CASE REPORT

CASE 5: A man 40 years of age had atopic dermatitis that had begun as a generalized eruption in infancy, then had become flexural in distribution with repeated recurrences since. The eruptions were more persistent on hands and face. Early and late hay fever complicated by mild asthma had occurred since the age of 12, but these symptoms had been greatly lessened by specific pollen therapy. Over the years, considerable and varied treatment had been given for the dermatitis, including local medicaments, x-ray, sunlight,

fever therapy, and more recently psychotherapy with only temporary beneficial effect. The patient had been tested previously but was told that foods were of no etiologic importance.

When first observed by the author, the patient had definite areas of atopic dermatitis on the cheeks, about the mouth, on the flexures and especially on the wrists and hands.

Intracutaneous skin tests revealed significant positive reactions to house dust, feathers, wool, tobacco, timothy, ragweed, English plantain, cornmeal, wheat, milk, cheese, chocolate, tomato, and a few other vegetables. On repeated testing, reaction to egg was negative.

Elimination and avoidance of positive inhalants was followed by only slight improvement. The patient then was put on a trial diet and after ten days to two weeks showed striking improvement. However, when egg was added to the diet, a pronounced flare-up occurred. When the dermatitis had subsided, another trial with egg was followed by a flare-up. Since then, no egg has been taken and the skin condition has been quite good except when the patient eats proscribed foods.

This case report illustrates very well the fact that patients with atopic dermatitis, even adults, may have allergic sensitivity to certain foods even though reaction to skin tests with allergens of them are negative. It emphasizes the importance of diet trial in such patients, especially if elimination of test-positive allergens does not relieve the condition.

Probably next in frequency to egg among the causative foods are milk and wheat. While any food allergen may be important, the exact incidence or the relative etiologic significance of any particular food is difficult to estimate because this information depends upon skin test reaction rather than upon clinical evidence or diet trial.

In addition to inhalant and food allergens, atopic dermatitis, like asthma, may be caused or aggravated by other factors, including bacterial, physical and psychosomatic.

The etiologic significance of bacterial agents is hard to estimate because it is difficult to establish an etiologic relationship. Bacterial sensitization from an infected focus (e.g., tonsils or teeth) may be responsible for atopic dermatitis. But this is even harder to prove in patients with atopic dermatitis than it is in those with asthma, since skin tests for sensitivity to bacteria are unreliable and even constitutional reaction from injected vaccine is less likely to provoke atopic dermatitis than it is to cause asthma. Proof is made additionally difficult by the fact that atopic dermatitis generally is worse in the winter or at times of seasonal change (summer to fall or winter to spring) when upper respiratory infections are prevalent. But (as was explained in the discussion of asthma) symptoms similar to those of infection in the upper respiratory tract may be due to allergic rhinitis provoked either by atmospheric changes or by excessive exposure to environmental allergens (e.g., dust or wool). Bacterial sensitization therefore is a possible secondary or aggravating factor but seldom is primary in invoking atopic dermatitis.

Atopic dermatitis also may be aggravated by various physical factors such as heat, cold, and physical exertion, just as is the case with asthma. In fact, any influence tending to increase skin irritability or to stimulate skin congestion and sweating also will either increase the tendency toward or actually aggravate already existing dermatitis. This applies to bacterial toxins or toxic products absorbed from the gastrointestinal tract, as in so-called "auto-intoxication"; also, probably, to such factors as fatigue, overfeeding or even dentition, mentioned often as a possible cause of atopic dermatitis. Experimental studies of this condition[11] indicated it is very likely that disturbances of the sweating mechanism may initiate or aggravate dermatitis.

The significance of psychosomatic influences in the production of atopic dermatitis likewise is a moot question. That they might be important is indicated by the continued use, especially by dermatologists, of the term "neurodermatitis" although it originally was intended to indicate vasomotor instability and not neurogenesis or psychogenesis. Unquestionably, emotional upsets and perhaps hidden or subconscious influences of various sorts can cause aggravation of the skin lesions. But, as in asthma, it is doubtful that such factors can be responsible primarily or entirely for the condition. The outstanding primary symptom of atopic dermatitis is itching, which causes the patient to scratch. This leads to subsequent thickening of the skin and explains the secondary excoriations and other changes in the skin. Undoubtedly, the degree of itching and secondary change will be greater in the overanxious, emotionally unstable psychoneurotic patient, but this does not prove necessarily that the primary factor responsible initially for the itching is psychosomatic. Another item of evidence against primary psychogenesis is the fact that this condition so often starts in infancy or early childhood, an age period in which psychosomatic influences supposedly seldom operate.

CLINICAL MANAGEMENT

As with other allergic diseases, treatment of atopic dermatitis may be specific, non-specific and/or symptomatic. The specific treatment of atopic dermatitis will depend largely upon whether the causative factor has been ascertained. Complete allergy study, including history, tests for sensitization and diet trial, is essential. Despite the current confusing reports, all patients should be tested for allergic reaction either by the scratch or intracutaneous method or, if this is not possible, as in eczematous infants, by the indirect or passive transfer method of Walzer. Patch tests are valueless from a practical standpoint and although study of them has been of some academic importance, they should not be used in the determination of offending excitants.

If the specific allergens to which the patient is sensitive can be determined, avoidance of contact with them or elimination from the diet, as the case may be, often will be followed by improvement or complete relief, especially if a specific food such as egg, milk or wheat is the principal excitant. Complete elimination of the latter foods is essential if the patient has allergic sensitivity to them. Due care

should be taken to see that no foods are taken which contain these elements even in small amounts. Removal of milk from the diet of infants may seem difficult, but efficient substitutes are available.

The striking benefits which sometimes follow food elimination are exemplified in the following case report:

CASE REPORT

CASE 6: A male child, 22 months of age, was first observed in June 1949 with "eczema" which had been present since early infancy. Some improvement had followed milk elimination but in April 1949 there was pronounced increase with subsequent progression. Mild attacks of rhinorrhea and slight wheezing were noted in June 1948. Family history was strongly positive for allergic disease; the mother was being treated for hay fever. When first observed, the child had severe atopic dermatitis affecting especially the flexures.

Reactions to intracutaneous skin tests were positive to house dust, ragweed pollen and also to milk, wheat, chocolate, green pea, tomato and string bean.

Following the initial examination and because of the history, milk was eliminated completely. This was followed by slight improvement. Later, when the tests were finished and all the test-positive foods eliminated, the dermatitis cleared completely. The mother noted that this was especially striking after tomato was taken away. This improvement has been maintained except for a mild outbreak after the ingestion of string bean given for purposes of diet trial and also after the ingestion of chocolate by the child unknown to the mother.

It is to be notetd that in this patient recovery followed elimination of foods alone and that, so far, desensitization procedures have not been necessary. But if there is recurrence which can be traced to inhalants, injections of the appropriate extracts will be given.

When specific food excitants are not revealed by the usual diagnostic methods or even during the course of further study, the patient should be placed on an elimination or trial diet for a period of one to two weeks, then individual foods added and the effect upon the eruption noted. If improvement follows, the diet trial should be continued until the eruption disappears. If not, other diets should be tried in order to determine definitely whether sensitivity to food is a factor. It must be remembered that the improvement in atopic dermatitis is much slower than in asthma; hence, the method of treatment should not be changed until sufficient time has been allowed for improvement to take place following the withdrawal of a certain food. Dietary restriction should not be too rigid in infants or young children with numerous positive reactions; it is preferable to exclude first the most important of the items to which there was positive reaction. Sufficient minerals and vitamins also should be added to compensate for any diminution caused by the dietary restriction.

Elimination of offending inhalants is just as important for patients with atopic dermatitis as it is for those with asthma. This may be easy with some allergens, such as feathers, and difficult with others such as house dust. If wool is a factor, the patient should be told either to provide substitutes (e.g., a cotton quilt for a woolen blanket) or to keep the wool covered in such a way as to prevent its coming into direct contact with the skin (as by lining woolen snowsuits for children with cotton sheeting) or from being inhaled (as by encasing a woolen blanket in a heavy cotton blanket cover). When inhalant contact cannot be completely avoided, specific desensitization may be required. This is true especially with regard to house dust, pollens and molds. Desensitization with extracts of animal danders or wool is not very effective but seldom is necessary.

Care should be exercised in the desensitization procedures, especially with house dust and pollen extracts. Constitutional reactions are slower in dermatitis than in asthma or hay fever and are indicated by aggravation of the dermatitis in 24 hours or longer rather than by acute flare-up. For example, a patient was being given injections of an autogenous house dust extract, and when the point of maximum tolerance was reached, further injections were followed in a day or two by new outbreaks of dermatitis. The injections were stopped and the skin cleared up. Later, the injections were begun again in lower dosage which was tolerated much better.

It is extremely important for the attending physician to recognize the delayed nature of reactions to these injections which might be responsible not only for aggravation of the dermatitis but also for persistence of it.

Non-specific measures sometimes may be required if specific treatment fails or if progress is slow. In the author's experience, however, nearly all our patients respond to specific treatment. Among the most often used of non-specific measures is autohemotherapy, which occasionally may be helpful in stubborn cases. Vitamin injections (notably vitamin B) are used extensively by dermatologists who believe them to be helpful in chronic cases. The author has had no personal experience with them nor observed indication for their use. Bacterial vaccines, either stock or autogenous, have a very limited application although some physicians claim good results with autogenous vaccines prepared from various foci of infection. Injections of histamine in increasing dosage are commonly used, but as in asthma the beneficial effect is limited and difficult to judge. But it is worthy of trial in selected cases. The author sometimes finds it useful as a substitute for other injections given for purposes of desensitization (e.g., house dust extract) especially when the latter is suspected of inducing reaction or producing aggravation of the existing dermatitis.

Regardless of whether specific or non-specific treatment is required, symptomatic or palliative measures usually are necessary even during the period of diagnostic study, to relieve the itching. These include local remedies to aid in the disappearance of the lesion. It often is surprising, however, how little local treatment may be required for patients in whom the causal factor has been found

and eliminated. Just as it is the wheezing which requires relief in asthma, in atopic dermatitis it is the itching. For itching causes repeated scratching which in turn aggravates the lesion and is responsible for excoriation and secondary infection and thickening of the skin. To reduce the damage of scratching, the nails should be kept short and the fingers clean to prevent secondary infection. If possible the lesions should be kept bandaged day and night to prevent access to them. Cardboard cuffs over the elbows and forearms may be necessary. The arms and legs may have to be tied to the side of the crib or bed.

The itching may be reduced by various local applications of soothing agents. For this purpose, it is well to obtain the advice of a dermatologist. Antipruritic lotions are helpful, especially if there is much itching and oozing. Bland ointments like Lassar's paste or those containing small amounts of crude coal tar likewise are beneficial. Soaps should be avoided and the skin cleansed either with olive oil or mineral oil or with soapless detergents. Roentgen-ray or ultraviolet therapy may be helpful in some cases but decision with regard to it is best left to a dermatologist.

Sedatives—bromides, barbiturates, chloral—may be used to relieve intense itching or to calm highly emotional patients. They may be given at regular intervals during the day, but especially at bedtime when the excessive warmth of bedclothes often increases itching. Coincident psychotherapy naturally should be given those patients requiring it, but in many instances calm reassurance will be sufficient.

The necessity for the use of psychotherapy seems to be inversely proportionate to the ability of the attending physician to find the cause of the dermatitis and to treat it successfully by specific measures. If specific cause is not found the patient is considered to be psychoneurotic and is treated accordingly. Then it may be noted that the dermatitis improves strikingly when the patient takes a vacation trip away from home in order to rest his "tired nerves," only to recur when he gets back. Recrudescence then is attributed, naturally, to the return to an environment conducive to emotional upset. That leaving home may also mean leaving environmental allergens is too often overlooked in such instances.

The antihistaminic drugs have been used extensively in the treatment of atopic dermatitis, but, as in asthma, it is difficult to evaluate correctly the statistical reports. Some patients obtain relief of the itching from these drugs given in full dosage orally three or four times daily. With so many drugs available, selection of one that is more effective than another would be difficult. The author has given Benadryl® or Pyribenzamine® with varying results; some patients benefited temporarily and others noted no benefit. It is the author's impression that the antihistaminics were more effective in patients with associated nasal symptoms than in those without them, which is to be expected if inhalants are responsible for the dermatitis. In the experimental study previously mentioned, it was found that Benadryl administered either by intramuscular or intravenous injection in doses from 20 to 50 mg. produced better results than it did when given orally. If the dermatitis was mild, it subsided more quickly with the drug than without; if severe, subsidence was slower. This is comparable perhaps to the effect of epinephrine in asthma. At any rate, it appears that antihistaminics may give symptomatic relief in some patients with atopic dermatitis and are worthy of further trial.

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Intracranial Angiography in the Treatment of Cerebral Vascular Accidents

Reports of Cases and a Review of the Literature

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SUMMARY

Five cases of intracerebral hematoma, including one case of calcified intracerebral hematoma, are presented and treatment is discussed.

The role of carotid arteriography, stellate ganglion blocks, vasodilator drugs and operation in the treatment of cerebral vascular accidents is discussed and typical cases of the various vascular anomalies of the cerebral vascular system are presented.

THE successful surgical treatment of a number of cerebral vascular lesions including five cases of intracerebral hematoma prompted a review of the literature concerning the methods of treatment of lesions of this type.

During the past decade or so there has been a change in the therapeutic approach to the problem of intracranial vascular accidents. Penfield[38] in 1933 said, "The right of the aged and hypertensive to die from apoplectic stroke undisturbed has been unchallenged for a long time." He concluded, after reviewing records of patients observed by him, that with careful study and selection of patients it "might be possible to do something for a larger number of them." Cushing,[14] Craig and Adson,[12] Rankin,[41] Pilcher,[39] Woodhall,[58] Klemme,[27] Karlen,[26] King[29] and Abbott[1] are a few among the many who have successfully challenged the right of these patients to "die undisturbed." Huesner[24] in 1888 was probably the first surgeon to report the evacuation of an intracerebral hematoma with recovery of the patient. In 1941 Meridith[36] reported that only 17 cases of surgically treated intracerebral hematoma were reported in the medical literature. By 1943 that number had increased to 33. Recently many instances of successful surgical treatment of cerebral vascular lesions of the type hitherto regarded as hopeless have been reported in the literature. These include the surgical removal of intraventricular hematomas,[13] ligation of aneurysms of the left middle cerebral arteries[49] and the successful treatment of lesions of the basilar and vertebral arteries.[30] Dandy[15] stated that he knew of no successful attack on lesions of those vessels, and his report of a sudden death upon manipulation of one vertebral artery has made most surgeons loath to work in that area.

With the more general use of the carotid arteriogram as an adjunct in the diagnosis, the indications for surgical aid for the patient with a cerebral vascular lesion are more definite. When the arteriogram is done by the percutaneous method as first demonstrated by Lowman and Meyerson[35] in 1936 and later by Shmidzu,[48] Brobeil,[7, 8] Kristiansen[31] and Lindgren,[33] it spares the critically ill patient the minor trauma incident to exposing the carotid artery in the neck. King,[28] Engeset,[16] Radner[40] and others have described similar methods for injecting the vertebral arteries. Wechsler,[57] List[34] and Gariepy,[17] to mention a few among many, have stressed the fact that carotid angiography is a safe diagnostic procedure that does not increase the surgical risk for patients who are in a precarious condition. List[34] stated, "It [angiography] carries little risk even in patients with high intracranial pressure since it does not interfere with intracranial hydrodynamics." A consideration of the mechanisms involved makes it readily apparent that the force that can be exerted through a 19-gauge needle by hand pressure on a rapidly flowing column of blood, in a vessel as large as the common carotid artery, is negligible; especially when it is remembered that the total flow of blood through the brain in the human is in excess of 600 cc. per minute.[19, 46]

According to Aring and Merritt,[4] Albertini,[2] Taylor and Page,[53] Buzzard,[9] Bidwell, [5] Church[10] and others, clinical differentiation of hemorrhage, thrombosis and embolism is not difficult. After studying two series of patients totaling 652 cases, Aring and Merritt concluded, "A thorough study of the history with the results of the physical and neurologic examinations and examination of the spinal fluid should make a differentiation possible in nearly 100 per cent of the cases." They pointed out that sudden severe headache, vomiting, stiffness of the neck and progression of symptoms are strongly indicative of hemorrhage and that these findings were present in 51 per cent of the hemorrhage cases reviewed. Spinal fluid pressure greater than 300 mm. of water did not occur with thrombosis but was noted in 38 per cent of the cases of hemorrhage. In 18 per cent of the patients with hemorrhage the spinal fluid pressure was above 400 mm. of water. Blood in the spinal fluid was observed macroscopically in 74 per cent of the patients with hemorrhage and in only 0.15 per cent of those with thrombosis.

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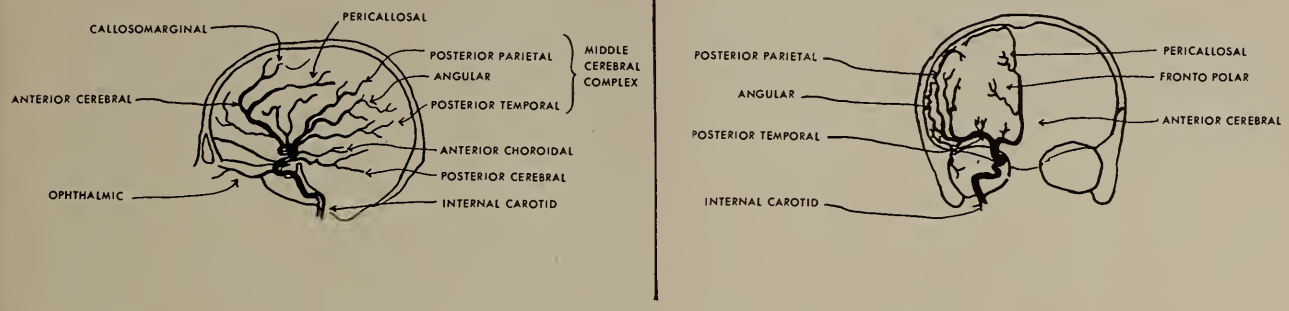
Rowbotham[44] said that in cases of intracerebral bleeding the spinal fluid contains blood. The authors did not find this to be so in cases observed by them (Case 4, intracerebral hematoma; and Case 8, traumatic arteriovenous fistula).

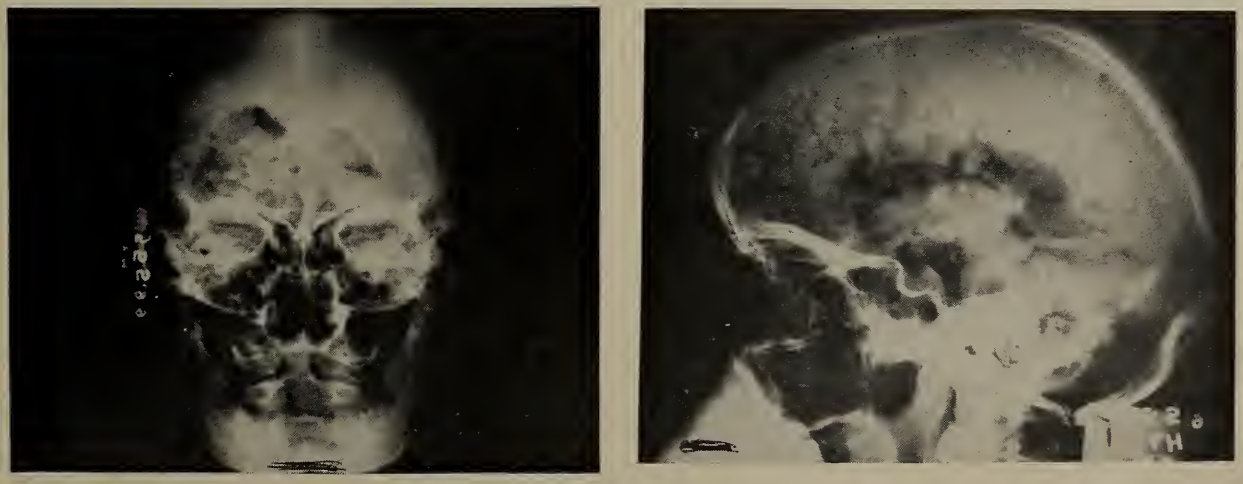
The frequency of occurrence of the various types of lesions in a series of 407 cases studied at the Boston City Hospital was: Thrombosis, 81.15 per cent; hemorrhage, 15.0 per cent; embolism, 3.2 per cent.

Alvarez[3] pointed out the necessity of taking a



A. Tracings of normal arteriograms.

B. Angiogram and tracing of a subdural hematoma.



C. Pneumoencephalogram showing depression of left lateral ventricle by subdural hematoma.

Figure 1

careful history from older people, in whom, he believes, small, usually unrecognized strokes are a common cause of illness. Globus[18] stressed that there is, in many patients, ample evidence of the disease process prior to the first episode of hemorrhage.

Where clinical signs are not of a localizing nature, as is often the case, Woodhall[58] and others report successful localization of the hemorrhage by electroencephalogram. This method has been of aid to the authors in several cases. Groff and Grant[21] pointed out that the clinical picture occurring with rupture of the middle meningeal artery or one of its main branches is often not sufficiently characteristic to differentiate it from other intracranial hemorrhages, but that the angiogram is strikingly characteristic. This is well illustrated in one of the cases observed by the authors (Figure 1, *b* and *c*). Shenken[47] stated that in cases of rupture of the middle meningeal artery or one of its main branches, surgical treatment, to be of any value, must be given within three to six hours or before decerebration occurs.

In cases of thrombosis or cerebral embolism, pronounced improvement in the clinical picture is often obtained by the use of stellate ganglion block and by the use of vasodilating drugs. De Takats,[52] Volpitto,[56] Risteen,[43] Gariepy[17] and others have reported rather amazing results following the use of stellate ganglion block. The authors have observed cases in which aphasia, hemiparesis and lesser neurologic disorders disappeared after stellate ganglion block, often done bilaterally. Rankin,[41] Cobb,[11] Ochsner and DeBakey[37] and others have pointed out the importance of relieving the vasospasm incident to cerebral thrombosis and embolism. Risteen and Volpitto[43] observed, during operation, the vasodilating effects of stellate ganglion block on the cerebral vessels. Villeret and Cachera,[55] working with experimental animals, observed through a window in the skull that, in all cerebrovascular accidents, surrounding the hemorrhagic or ischemic zone there is a zone of stasis and vasoparalysis with segmental spasm of the vessels. De Takats and Gilbert[52] recommended the use of aminophylline in doses of 0.3 to 0.5 gm. given intravenously with stellate block. They noted in animals that bilateral stellate block was much more effective than unilateral block. Reese[42] reported on the beneficial effects of 0.12 gm. of aminophylline thrice daily in arteriosclerotic patients with neurologic deficits. Howard[25] and coworkers, who did extensive work on the physiologic action of aminophylline, reported that it reduced venous pressure, stimulated respiration and shortened circulation time.

Intracerebral Hematoma:

CASE REPORTS

Case 1: A 30-year-old white male, admitted to the hospital in a comatose state, had complained of headache that morning and at noon was found unconscious. There was nothing of significance in the past history.

At the time of examination the patient was unconscious, lying with the left arm and leg flexed. There were convulsive motions of the right arm. The skin temperature was definitely lowered on the entire right side of the body. The pupils were equal and reacted to light. The neck was very stiff and Brudzinski and Kernig signs were present. Reflexes were increased on the right and Hoffmann's sign on the right was noted. Response to painful stimuli was greater on the left side of the body than on the right. There was gross blood in the spinal fluid and the pressure was 490 mm. of water.

The patient remained comatose. The spinal fluid gradually cleared to a xanthochromic color. A left common carotid arteriogram on the eighth day (Figure 2, *a* and *b*) showed posterior-inferior displacement of the middle cerebral complex of vessels and anterior-inferior displacement of the anterior cerebral artery.

A ventriculogram (Figure 2, *c*) revealed depression of the frontal horn of the left lateral ventricle. A 6-cm. intracerebral clot was removed from the left frontal lobe, leaving a smooth-walled cavity without bleeding points. The postoperative course was uneventful and the neurologic deficits disappeared. The patient returned to work after a convalescence of six weeks, and a three-year follow-up was uneventful.

Case 2: A 33-year-old white female was admitted to the Sonoma County Hospital with a purulent discharge from the right ear. Subtotal mastoidectomy had been done 21 days before, and three days later the patient complained of headache, became very talkative in a repetitious manner and showed pronounced loss of normal inhibitions. This state was followed by profound lethargy from which the patient could be aroused only with great difficulty. The following day the pupil of the right eye dilated, and then both pupils became fixed to light. However, slow improvement followed, and upon spinal fluid tap the pressure was normal and the fluid xanthochromic. There were 22 lymphocytes present in each cubic mm. The patient was discharged from the hospital and was readmitted seven days later with the previously noted complaints.

The patient was semi-comatose. The blood pressure was 130 mm. of mercury systolic and 80 mm. diastolic, and the temperature was 98.4° F. The pupils were equal and reacted to light. Pronounced stiffness of the neck was noted. Papilledema was not present. The patient did not move the left extremities. The reflexes were increased on the left and response to painful stimuli applied to the left side of the body was less than to the same stimuli applied on the right. A right homonymous hemianopsia had been detected before the patient became comatose. Pronounced xanthochromia was noted in the spinal fluid. Spinal fluid pressure was 290 mm. of water and there were 25 lymphocytes present in each cubic mm. The protein content was 102 mg. per 100 cc.

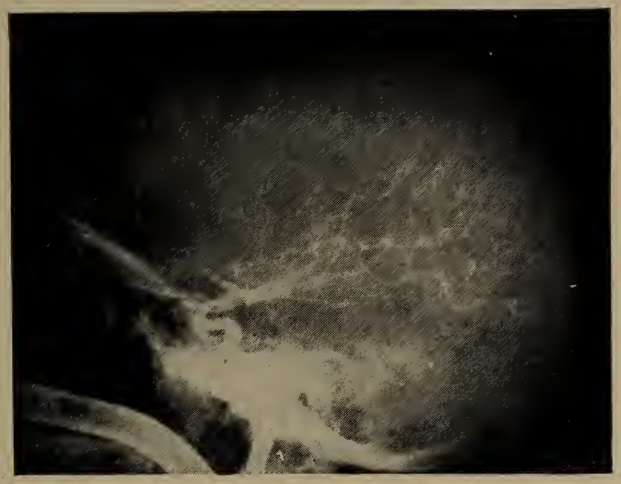
On the basis of these findings a burr hole was made over the anterior part of the right temporal lobe and an intracerebral hematoma containing 90 cc. of old blood was evacuated, leaving a cavity lined with old blood pigment which was washed out.

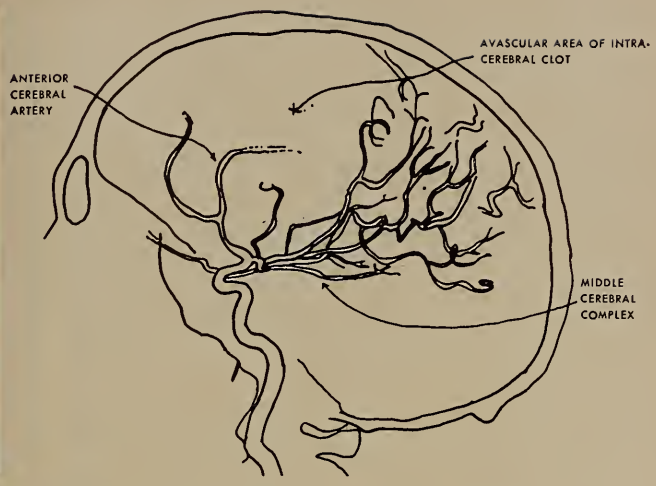
The patient regained consciousness on the operating table and the postoperative course was uneventful for the follow-up period of 18 months.

Case 3: A 52-year-old white male was admitted with complaints of intense occipital headache, nausea and vomiting. There was weakness of the left side of the body.

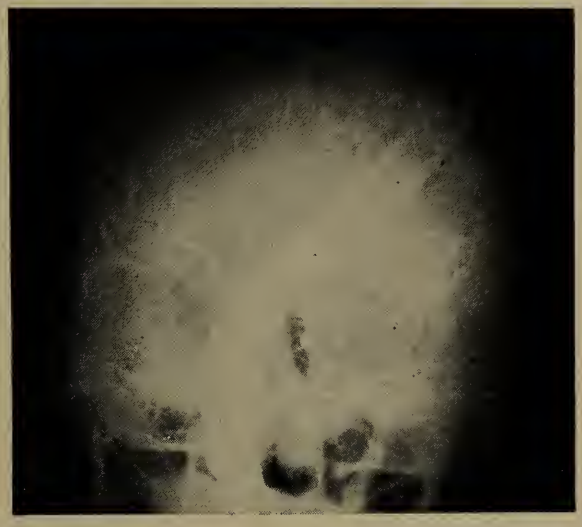
There was a history of hypertension for many years. The severe occipital headaches had been present for four months. Four days before admission the patient had awakened with headache and soreness and stiffness of the neck, and had vomited.

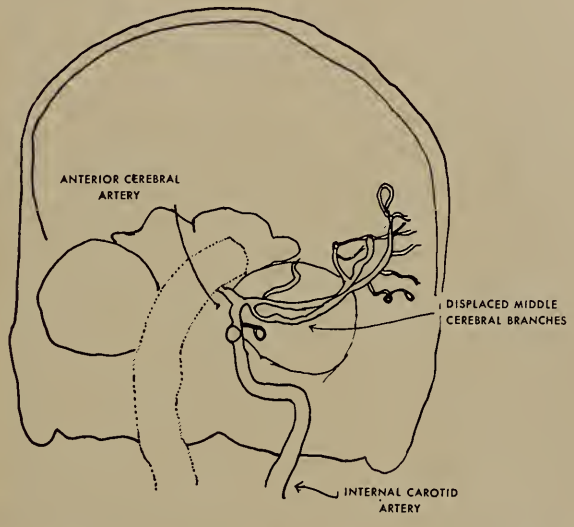
The patient appeared to be confused. The blood pressure was 160 mm. of mercury systolic and 90 mm. diastolic. The



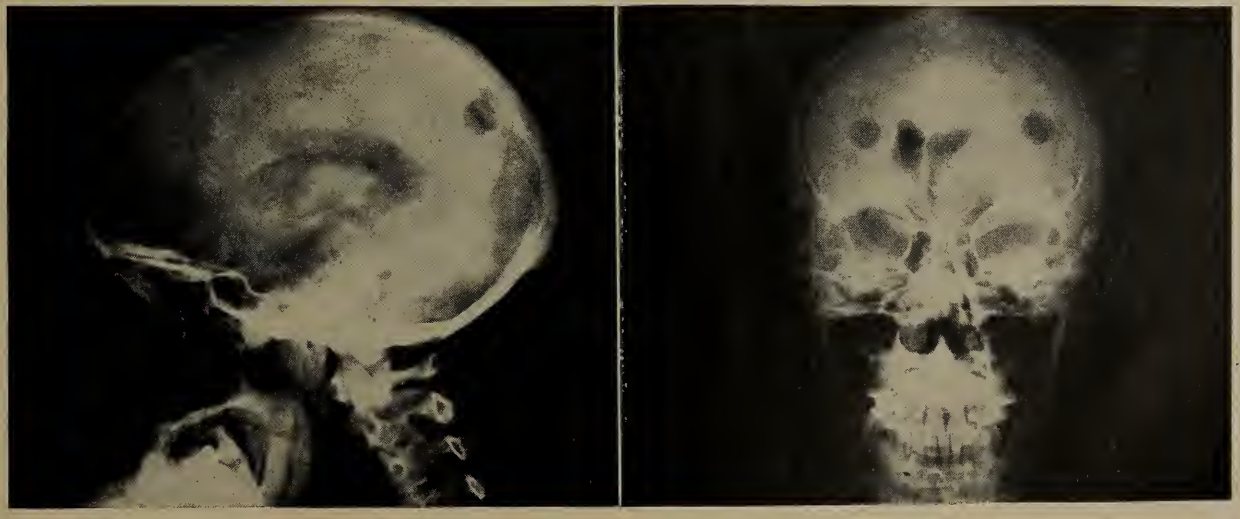


A. Intracortical clot. Angiogram showing displacement of the middle and anterior cerebral arteries.





B. Intracortical clot. Anterior-posterior angiogram.



C. Ventriculogram of above case – depression and shift to right of left lateral ventricle.

Figure 2

pupils were equal in size and responded to light. There was one diopter of papilledema bilaterally. The neck was very stiff. Spastic left hemiplegia and a left hemihypalgesia were noted. Hoffmann's sign and Babinski's sign were present on the left side. The spinal fluid was xanthochromic and at a pressure of 260 mm. of water. A right common carotid arteriogram was done and an abnormal vascular pattern was apparent in the distribution of the right middle cerebral artery.

A ventriculogram revealed depression of the right lateral ventricle with medial shift of the anterior horn. A semiliquid intracerebral hematoma was evacuated from the right frontal lobe. Recovery from the hemiplegia was uneventful and sensory deficit cleared. The patient remained well during a two-year follow-up.

Case 4: A 23-year-old white male was admitted to the Merced County Hospital with complaint of weakness and numbness of the left extremities and inability to talk.

Well until the day of entry, the patient had noticed while at school that he could not hold a pencil in the left hand. Three hours later he noticed weakness in the left leg and he became aphasic. In x-ray films of the head enostosis of the parietal skull on the right was noted, and intracerebral calcifications were observed beneath the enostosis. A presumptive diagnosis of meningioma was made.

The patient was lethargic with spastic left hemiparesis and left hemihypesthesia. He was nauseated and vomiting. The left tendon reflexes were increased but no pathologically significant signs in fingers or toes were present. There was complete astereognosis in the left hand. The spinal fluid was normal. A small firm tumor of the right parietal scalp, presumably a lipoma, was noted.

The lethargic state progressed to coma, with severe headache and vomiting. Papilledema developed. A right carotid arteriogram revealed a large group of abnormal venous channels in the right parietal area.

A ventriculogram revealed displacement of the right lateral ventricle consistent with a high parietal mass on the right. At operation a number of abnormally large veins were encountered on the surface of the cortex. A large intracerebral clot was evacuated from the right parietal lobe. It contained calcium with old organized clot and fresh clot of jelly-like consistency. The patient gradually recovered from the paresis and the speech defect and remained well during a two-year follow-up.

Case 5: A 27-year-old white male was admitted with complaints of left-sided headache, nausea, vomiting, blurred vision and transient attacks of complete aphasia.

There was history of a right-sided convulsion with unconsciousness at six months of age, with similar attacks intermittently for the ensuing six months. Three years prior to admission the patient had received a blow to the left side of the head in an auto accident. This had been followed by weakness of the right arm and leg, nausea and vomiting.

Hemiatrophy of the right side of the body was noted upon physical examination. The pupils were equal and reacted to light. There was no papilledema. There was right hemiparesis and hemihypesthesia with increased reflexes, but no pathologically significant signs in fingers or toes. Partial motor aphasia was noted. The spinal fluid was clear and the pressure was normal. A left common carotid arteriogram revealed a mass in the left parietal lobe.

A large mass of clotted thin-walled veins and an old organized hematoma were removed from the left parietal lobe. Postoperatively, mild motor and sensory loss on the right side of the body persisted. During a two-year follow-up the patient had one transient attack of motor aphasia.

Aneurysm of the Middle Cerebral Artery:

Case 6: A confused, disoriented, 51-year-old white male was admitted with complaints of severe bitemporal headache, nausea, vomiting and stiffness of the neck.

The patient had been well until four days before admission, when severe bitemporal headache and nausea suddenly developed and coma lasting 20 minutes followed.

The pupil of the left eye was large and reacted sluggishly to light. There was left spastic hemiparesis without pathological reflexes. The spinal fluid was xanthochromic and the pressure was 410 mm. of water. A right common carotid arteriogram revealed an aneurysm of the middle cerebral artery (Figure 3. *a*). The patient died before he could be prepared for operation. Hemorrhage from aneurysm was demonstrated at autopsy.

Thrombosis of the Middle Cerebral Artery:

Case 7: A 22-year-old Japanese male was admitted with spastic right hemiplegia and partial motor aphasia.

Five years previously, weakness of the right arm and aphasia had developed suddenly and a generalized convulsion had followed. The aphasia and weakness gradually cleared over a three-year period. A year previously the weakness and aphasia recurred and persisted for three weeks. The patient was hospitalized at that time and a diagnosis of multiple sclerosis was made. The condition remained unchanged.

Upon examination, partial motor aphasia, alexia and atrophy of the right extremities, superior right quadrantic hemianopsia, right hemiplegia with flaccidity, and right hemihypesthesia were noted. Hoffmann's and Rossolimo's signs were present. The spinal fluid was normal. A left internal carotid arteriogram revealed thrombosis of the left middle cerebral artery.

Bilateral stellate ganglion blocks and aminophylline gave only temporary improvement, probably due to the age of the lesion (five years).

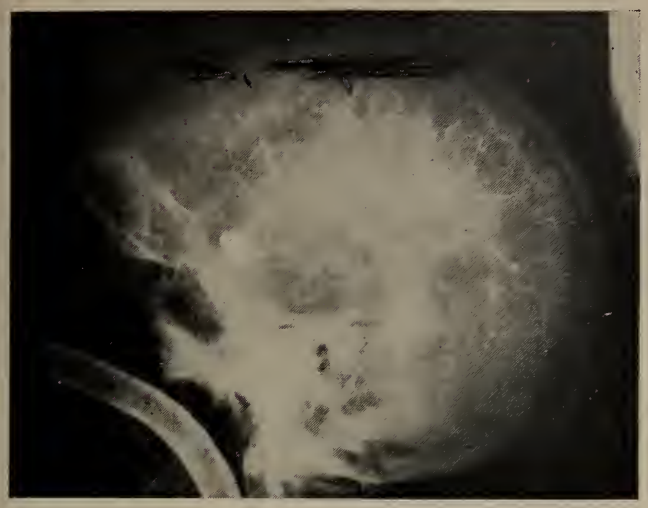
Traumatic Arteriovenous Fistula:

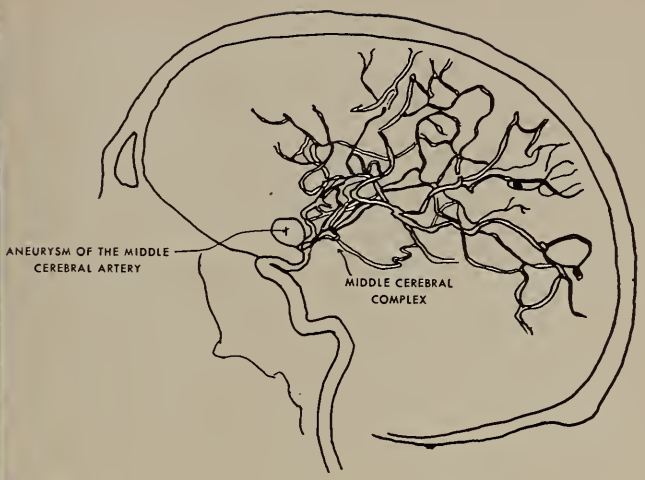
Case 8: A 30-year-old white male was admitted with a painful pulsating exophthalmus of the left eye, nausea, headache and blurring of vision.

Two months previously the patient had received fractures of the left ankle and of the left ramus of the mandible, and abrasions of the left forehead, in an airplane crash. Three weeks before admission, pain in the left eye developed and was followed shortly by protrusion of the left eye and a roaring in the head.

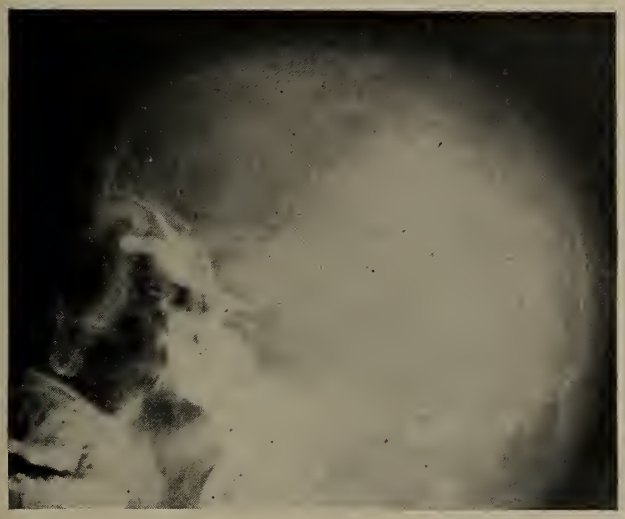
Upon examination, pronounced proptosis of the left eye and moderate periorbital edema were noted. A loud systolic bruit was heard on auscultation of the head. Occlusion of the left carotid artery decreased the bruit. There was paralysis of all the external ocular muscles of the left eye and the pupil was fixed in the mid-position, indicating autonomic paresis as well as third, fourth and sixth nerve paralysis. There was loss of sensation over the first and second divisions of the trigeminal nerve on the left. A left carotid arteriogram (Figure 3, *b*) confirmed the clinical impression of a lesion of the left cavernous sinus.

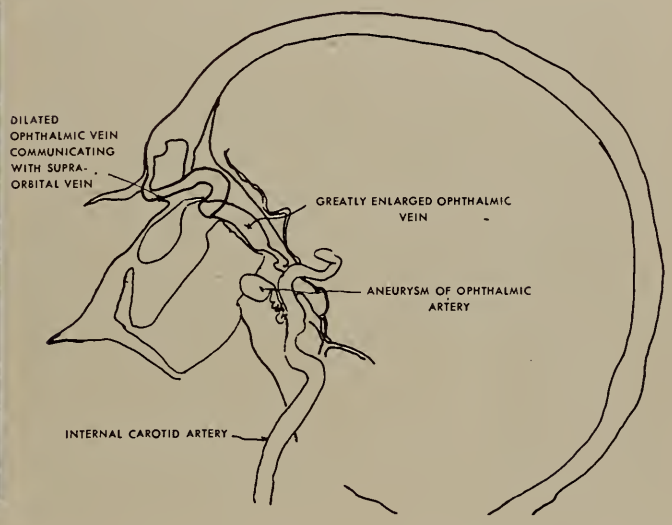
Intermittent occlusion of the left carotid artery was carried out. A clamp was devised which permitted occlusion to the point that the noise in the head could not be heard. The period of occlusion was gradually increased until it could be maintained for 60 minutes. The left common carotid artery was then ligated. This decreased the proptosis, headache and bruit. Ten days later the left external and internal carotid arteries were ligated. This resulted in disappearance of the bruit and gradual reduction of proptosis. During the two-and-a-half-year follow-up proptosis disappeared entirely and there was no recurrence of symptoms.



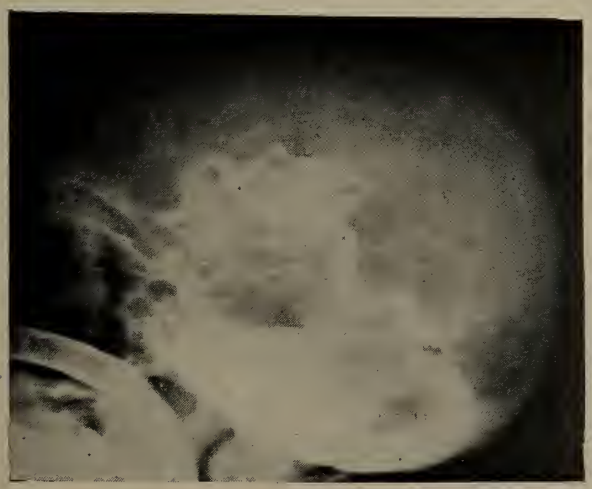


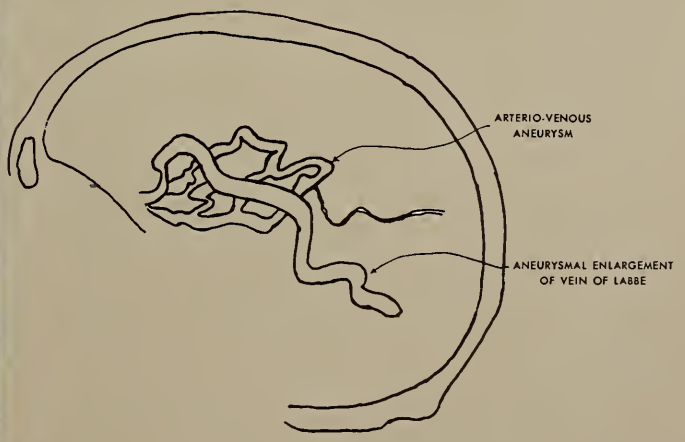
A. Aneurysm, left middle cerebral artery — lateral view.





B. Arterio-venous fistula, right carotid and cavernous sinus.





C. Arterio-venous aneurysm supplied by middle cerebral artery.

Figure 3

Arteriovenous Aneurysm:

CASE 9: A 29-year-old white male was admitted with complaints of inability to talk, double vision and dizziness, with blurring of vision on turning the head to the left.

Twelve months previously, motor aphasia developed suddenly and was followed by gradual development of blurring of vision, nausea and coma. Spinal fluid pressure at that time was 310 mm. of water and the fluid was xanthochromic. At that time the patient was found to have bilateral papilledema and anopsia in the right lower quadrant. These conditions gradually cleared over a period of several months. Then aphasia and blurring of vision gradually returned, beginning about a month prior to the present admission.

The pupil of the right eye was large. Bilateral papilledema and right lower hemianopsia were noted. There was partial motor aphasia and right hemiparesis with increased reflexes. Stereognosis was impaired on the right. The spinal fluid was clear and the pressure was 250 mm. of water. A left carotid arteriogram (Figure 3, *c*) revealed a mass of enlarged vessels having the appearance of a cavernous hemangioma. The patient was not willing to undergo operation and was given a course of deep x-ray therapy which did not alter the clinical condition.

Arteriovenous Aneurysm of the Scalp:

CASE 10: A 26-year-old white male was admitted with complaints of pain over the left side of the head, and in the left eye, and a buzzing noise in the left side of the head.

Nine years previously the patient had received a severe blow to the head in an automobile accident. A soft swelling over the left temple had persisted since the time of the accident. The noise and the pain had been first noticed two years previously.

Upon examination, a soft, smooth, non-pulsating swelling over the left side of the head was observed. There was a thrill on palpation, and upon auscultation a high-pitched bruit, which disappeared on compression of the left carotid artery, was noted. There were no other significant neurologic findings. A large "port wine stain" of the left cubital fossa was noted. A phonocardiogram revealed that the bruit had both systolic and diastolic components. A left common carotid arteriogram revealed an arteriovenous angioma of the superficial, temporal and frontal arteries of the scalp. This lesion was removed completely with immediate relief of signs and symptoms. The patient remained well during a three-year follow-up.

DISCUSSION

It is of interest to note that in several of the cases of intracerebral hematoma here reported, a smooth-walled cavity remained after removal of the clot. This finding is in agreement with the observations of Scheinker,[45] Craig and Adson[12] and many others who have expressed belief that many spontaneous intracerebral hemorrhages are of venous origin. Sachs, in discussing this problem,[45] pointed out that in children spontaneous intracerebral hemorrhages are almost always of venous origin. In one patient treated by the authors (Case 5) the hemorrhage was undoubtedly of venous origin, as many of the thin-walled veins were observed in the clot on histologic examination.

The presence of calcium in an intracerebral hematoma (Case 4) has been previously observed.[32] Grantham and Smolik[20] stated in 1942 that only two such cases were reported in the medical literature.

Hamby[23] and Browder and Turney,[6] in discussing the disposition of the intracerebral blood in hemorrhage, reported that in necropsy of patients who died a few hours after the hemorrhage occurred, clotted blood was found, but that in those who survived 12 to 15 hours the intracerebral blood had become syrupy and suitable for aspiration.

As to the indications for surgical intervention in cases of cerebral vascular accidents, Gurdjian[22] observed: "In acute hemorrhagic conditions, the one important symptom justifying exploration is increasing drowsiness or stupor." Craig and Lipscomb[13] stated that in all cases of expanding lesions of the brain, operation should be considered not only to relieve the symptoms but to establish a diagnosis. Meridith[36] expressed the opinion that "No patient, however moribund, should be denied the benefit of at least a limited procedure—as often a surprisingly happy solution will be encountered which is undoubtedly life saving to the patient and of considerable satisfaction to all those concerned with the case." Hamby[23] expressed belief that operation should be considered for patients with apoplectic or with gradual onset of symptoms, with progression of the signs and symptoms and development of signs of increasing intracranial pressure. Penfield,[38] in summarizing a report of cases observed by him, felt that had he been more prompt in giving surgical aid, the life of one patient could have been saved and residual hemiparesis that occurred in a 14-year-old boy could have been prevented.

The authors believe that at least an angiogram and at least a limited surgical procedure as a step toward diagnosis and a more positive approach toward the saving of life is warranted for patients who survive the shock of hemorrhage yet show no evidence of improvement.

490 Post Street.

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Carcinoma of the Cervix

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SUMMARY

Studies by eminent surgeons to reevaluate the place of radical operations in the treatment of carcinoma of the cervix—now that extensive procedures have become less hazardous—apparently have led to confusion in some minds as to choice between surgical and radiation therapy. Pending outcome of the studies, general employment of surgical treatment is unwarranted. Radiation is the treatment of choice in most cases, particularly if the lesion is in an early stage, although radical operation is indicated in certain rare early cases in which delivery of an effective dose of radiation to involved areas is technically difficult. Elsewise it appears at present that operation should be used only in cases of stages III or IV carcinoma—in which results by either means of treatment are poor.

One hundred and seven patients were treated with a combination of x-ray and radium irradiation. X-ray was used first to reduce the hazard of implanting the radium. The "five-year arrest" rates were as follows: For 22 patients with stage I lesion, 70 per cent; for 31 with stage II, 55.7 per cent; 33 with stage III, 39.7 per cent; 21 with stage IV, 0. Eighteen patients with diagnosis of carcinoma of the cervix who had had subtotal hysterectomy were treated. The stage of the disease could not be determined. In this group the five-year arrest rate was 52 per cent.

A GREAT deal of confusion seems to have arisen as to the proper therapy of carcinoma of the cervix — confusion regarding choice between surgical treatment and radiation.

Improvement in surgical techniques, the advent of antibiotics and chemotherapy and the general use of plasma and whole blood transfusions have made extensive operations less hazardous than they were when radical surgical procedures for carcinoma of the cervix were introduced 30 years ago. In light of these advances there is today an honest and noteworthy attempt being made by certain outstanding surgeons in this country to reevaluate the role operation should play in the treatment of this disease.

Unfortunately, the mere fact that the question is being explored by surgeons of high repute appears to have led to unwarranted widespread increase in resort to operation. For this reason it should be stressed that even radical surgical therapy ought not be generally employed until the conclusions of the current studies in reevaluation are firmly established. Surgical procedures less than radical, of course, will produce no more cures than they did 30 years ago.

Meanwhile the techniques for treatment of carcinoma of the cervix by radiation have also been improved. Tissue doses and tolerances are now quite generally known. The results are fairly uniform, although clinical evaluation and interpretation of data may vary. Properly administered radiation therapy of early carcinoma of the cervix gives good results; results of cauterization or routine hysterectomy are poor. There are rare cases in which the primary lesion appears to be in an early stage and the broad ligaments seem free of disease, yet lateral pelvic or obturator nodes are palpable. Radical operation then is indicated, as it is technically difficult to deliver an effective dose of radiation to the area in which those nodes lie. On the other hand, carcinoma of the cervix without lateral pelvic wall involvement is more safely treated by adequate radiation therapy than by routine hysterectomy or by so-called radical surgical excision in most hands.

The reports of surgeons now attempting to evaluate the role of radical surgical treatment in this disease almost routinely agree that it should be limited to thin, highly selected patients in whom the lesion is at a very early stage. Somewhat at variance is the authors' belief that early carcinoma should be treated with radiation because of the known good results, and that radical operation should be tried in cases of stage III or IV carcinoma with extensive local disease or lateral pelvic wall involvement, in which the results by either method are admittedly poor. The procedure advocated by Brunschwig in which the bladder, rectum and practically all pelvic structures are removed may be worth while in some advanced cases.

Radium is readily usable in treatment of carcinoma of the cervix because it can be placed in close proximity to the lesion and because the cervix tolerates radium therapy well. Radium properly applied to the cervix will control the primary lesion in most instances, but will not deliver an effective dose to a tumor located at a distance greater than 3 to 4 centimeters from the cervical canal. Therefore, external irradiation must be relied upon for adequate treatment of parametrial and outlying tumor-bearing regions. Patients would not be able to tolerate the amount of roentgen radiation required to deliver to the parametrial regions the same doses as are obtained throughout most of the pri-

TABLE 1.—*Results of Combined X-ray and Radium Treatment of Patients with Carcinoma in Stages I, II and III, and for Hysterectomized Patients with Stage of Disease Unknown.*

Results Five Years After Diagnosis	Mathematical Symbol	Stage I	Stage II	Stage III	Hysterectomized Patients, Stage of Decrease Unknown
All cases diagnosed	T	22	31	33	18
Died within 5 years	D	2	6	13	3
Alive with cancer at end of 5 years	W	1	2	2	0
Alive, free of cancer at end of 5 years	F	14	16	12	9
Alive, condition unknown at end of 5 years	U	0	0		0
Not traced for 5 years	N	5	7	6	6
Percentage arrested $\frac{F}{T} \times 100$		63.6%	49.3%	36.4%	50%
Percentage unknown $\frac{UN}{T} \times 100$		22.7%	22.6%	18.1%	33.3%
Expected deaths	E	2.05	2.29	2.76	.70
Expected survivors (T—E)	t	20	28.71	30.24	17.3
Adjusted percentage arrested $\frac{F}{t} \times 100$		70%	55.7%	39.7%	52.0%

mary lesions by radium applied to the cervix. However, by combining the two, the total volume of tissue receiving an effective dose is increased. The authors believe that x-ray therapy should precede the insertion of radium because it reduces the tumor mass and associated infection. The presence of a large infected or necrotic mass makes the insertion of radium hazardous, since instrumentation and the packing necessary to maintain the radium in position frequently exacerbate the condition. Furthermore, preliminary x-ray therapy greatly reduces the size of the tumor, so that the radium, when inserted, is nearer the residual carcinoma.

Combined x-ray and radium was used by the authors in treating 107 patients. In all cases x-ray therapy preceded the introduction of the radium. The adjusted five-year arrest rates in stages I, II and III of the disease are shown in Table 1. Some of the patients with stage IV carcinoma were treated for arrest, some for palliation only. The results are shown on Table 2. Eighteen additional patients with a diagnosis of carcinoma of the cervix, who had had subtotal hysterectomies, were treated by the same procedure. In this group, the stage of disease could not be determined. The results in this group (Table 1) were about the same as the composite result for the rest of the patients, taking all stages together.

Table 3 gives the over-all corrected five-year cure rate for all patients treated.

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TABLE 2.—*Results of Combined X-ray and Radium Treatment of Patients with Stage IV Carcinoma. Some Treated for Palliation Only.*

Results Five Years After Diagnosis	Mathematical Symbol	Total all Cases Diagnosed	Treated for Arrest	Treated for Palliation Only
All cases diagnosed	T	21	13	8
Died within 5 years	D	19	12	7
Alive with cancer at end of 5 years	W	1	1	0
Alive, free of cancer at end of 5 years	F	0	0	0
Alive, condition unknown at end of 5 years	U			
Not traced for 5 years	N	1	0	1
Percentage arrested $\frac{F}{T} \times 100$		0%	0%	0%
Percentage unknown $\frac{UN}{T} \times 100$		4.8%	0%	12.5%
Expected deaths	E	2.1	1.02	1.08
Expected survivors (T—E)	t	18.9	11.98	7
Adjusted percentage arrested $\frac{F}{t} \times 100$		0%	0%	0%

TABLE 3.—*Combined Results of X-ray and Radium Treatment of Carcinoma, All Stages*

Results Five Years After Diagnosis	Mathematical Symbol	Total all Cases Diagnosed	Treated for Arrest	Treated for Palliation Only
All cases diagnosed	T	125	117	8
Died within 5 years	D	43	36	7
Alive with cancer at end of 5 years	W	6	6	0
Alive, free of cancer at end of 5 years	F	51	51	0
Alive, condition unknown at end of 5 years	U	0	0	0
Not traced for 5 years	N	25	24	1
Percentage arrested $\frac{F}{T} \times 100$		40.8%	43.6%	0%
Percentage unknown $\frac{UN}{T} \times 100$		20%	20.5%	12.5%
Expected deaths	E	9.9	8.82	1.08
Expected survivors (T—E)	t	115.1	108.2	6.0
Adjusted percentage arrested $\frac{F}{t} \times 100$		44.3%	47.2%	0%

Hematologic Features Which May Influence Rh Immunization

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SUMMARY

The biologic features which may influence Rh sensitization in the mother and hemolytic disease in the newborn are conditioned by the hereditary immunologic pattern of the subjects, the antigenic characteristic of the blood group specific substances, the character of the antibody responses, the inherent susceptibility to disease as a result of the immune mechanism, and the character and sequence of exposure to the antigenic substance. In respect to Rh-negative women, there appears to be a greater vulnerability to immunization among those of blood group A. In regard to the infant, the compatibility of the maternal-infant blood types and the part they play in the phenomenon of the competition of antigens may influence the occurrence of hemolytic disease in the newborn.

THE processes of immunization which may result in the prevention of disease have in some instances been found to induce disease. A person who has developed immune bodies to the Rh or Hr factors may subsequently bear a child with hemolytic disease of the newborn, or may have a transfusion reaction in the event of exposure to blood containing the factor responsible for the sensitization.

In order for Rh immunization to occur during pregnancy, the blood of the mother must *lack* the specific Rh factor present in the fetal erythrocytes. The presence of this combination, however, is not the sole determining factor in the production of Rh antibodies. A few mothers may develop Rh antibodies during the first Rh-positive pregnancy, some in the second Rh-positive pregnancy, and some may have several Rh-positive babies and neither have demonstrable Rh antibodies nor produce afflicted infants. Among those women who *do* form antibodies and *bear afflicted children*, wide variations occur in the amounts of Rh antibodies they produce —some develop a high titer whereas others may have a persistently low titer. It may be seen, therefore, that in addition to the presence of Rh incompatibility between mother and child, other factors will determine sensitization in the Rh-negative woman.

Since it is possible for a disease to occur as a result of immunization, it is important to investigate those biologic features which may influence the character of the immune response, such as the part played by the reticuloendothelial and lymphoid systems, the hereditary features of the blood type and its characteristics, and the individual immunologic history.

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THE ROLE OF THE RETICULOENDOTHELIAL AND LYMPHOID TISSUES

The reticuloendothelial system may be defined as a group of cells having endothelial and reticular attributes and showing a common phagocytic behavior toward dyestuffs. The cells of the reticuloendothelial system were classified by Aschoff[1] into local histiocytes (sessile macrophages) and migrating histiocytes (wandering macrophages). The local histiocytes are divided into two groups: (1) The less active reticular cells of spleen, lymph nodes, the lymphatic tissues, and thymus, and (2) the very active endothelium of liver capillaries (Kupffer cells), spleen sinuses, lymph sinuses, marrow sinuses, adrenal and hypophyseal capillaries. The migrating histiocytes are divided into (1) the tissue macrophages, and (2) the blood macrophages. The part that the reticuloendothelial system plays in the immune mechanism is not entirely known, but the available evidence indicates that this system is essential to the production of antibodies. The cells of the reticuloendothelial system are widespread throughout the body. They remove foreign matter from the circulation (bacteria, protozoa, cells, and particulate matters), and they are important in the phagocytic mechanism of immunity. The tissue macrophages may store antigenic materials which may be released and carried about by wandering phagocytic cells. These materials may eventually stimulate the production of immune bodies. Reactions of the reticuloendothelial system are found to be more pronounced in instances where sensitization is induced by *repeated* infections of the blood stream.[11] Although there are many controversial points concerning the exact role of the reticuloendothelial system in immunity, it must be considered as one of the important factors influencing the immunologic response.

There is also some evidence that the lymphocyte and lymphatic tissues play a part in the elaboration of immune bodies. Harris and co-workers[4] found in the rabbit a rise in the antibody content of the lymph from an immunized lymph node, an increase in the number of lymphocytes, and a higher content of antibody in the lymphocytes than in the lymph itself following the injection of typhoid or sheep erythrocyte antigens. Such lymphocytes could be

made to yield antibody but not to absorb it. There is still some controversy over the role of the lymphocyte in antibody formation, since it has not been determined whether the large cells comprising the germinal centers of the lymph nodes are derived from reticulum cells or from altered lymphocytes.[3,5] The reticulum cells and lymphocytic elements in the lymph nodes react quite differently toward the vital dyes and, until more conclusive proof is furnished that a relationship exists between reticulum cells and lymphocytes, they must be regarded as distinct entities.[1]

At present, the reticuloendothelial and lymphoid cells must be considered to contribute to the formation of antibodies, and apparently both tissues are involved in the immune mechanism. A person having a highly reactive reticuloendothelial system might be predisposed to a greater degree of sensitization when exposed to an antigenic stimulus.

HEREDITY

The hereditary immunologic response pattern of the individual may influence the immune mechanism and it is dependent upon (1) the status of the individual as a secretor or non-secretor, (2) the blood type, and (3) the tissue vulnerability of the individual.

1. *The secretor or non-secretor status of the individual.* The secretor character is inherited as a Mendelian dominant and it is present in 80 to 85 per cent of the white population. It divides human beings into two categories: (a) those in whom the group-specific substances (A and B) may be found in the body cells and fluids as well as in the red blood corpuscles (*secretors*), and (b) those persons in whom the group-specific substances (A and B) may be found only in the red blood corpuscles (*non-secretors*). The differences between the two are due to the nature of the specific antigenic substance; in the former it is freely diffusible, while in the latter it is found exclusively within cells. The secretor character when present is fully developed in the tissues of the newborn, whereas the blood group factor in the red blood corpuscle may be underdeveloped and weakly reactive.[6, 11, 13] This phenomenon is important in instances of Group A or B infants born to mothers who lack the A or B blood group factor in their red blood corpuscles.[8] In some instances, the mothers may develop an increase in anti-A or anti-B agglutinins which might eventually gain access to the blood stream of the child and cause hemolytic disease. The fact that hemolytic disease seldom occurs in such instances may be due to the high incidence of secretors (who absorb the agglutinin) and the fact that this feature is fully developed in the tissues at birth whereas the blood group factor (A or B) may not be fully developed in the red blood corpuscles of the newborn.

2. *The blood type.* There is some evidence to show that the blood group may be involved in the predisposition to diseases due to peculiarities in the immune mechanism. The authors have noted that the incidence of hemolytic disease of the newborn, hemolytic anemia, sickle-cell anemia, and Mediterranean anemia is a little higher in subjects with Group O blood than it is among subjects with blood of other types (Table 1). This may indicate that the Group O red blood corpuscle is more vulnerable to this type of disease process.

TABLE 1.—*The Incidence of the ABO Blood Groups in Anemias and Diseases Involving the Antigen-Antibody Mechanism*

Disease	No. of Cases	Blood Group O	A	B	AB
Mediterranean anemia	16	9	6	1	0
Hemolytic anemia	27	15	8	4	0
Hemolytic disease of the newborn	97	50	39	7	1

In instances of immunization by antigens of the red blood corpuscle (A, B, Rh, Hr, and other rarer antigens), a subject lacking many of these characteristics would have a greater opportunity of exposure to blood containing one of them during transfusion or pregnancy and thereby have a greater chance of becoming immunized.

In a study of Rh immunization, it was found that a significant correlation exists between the occurrence of Rh immunization and the ABO blood types of Rh-negative women.[9] In a series of 120 Rh-negative women who bore afflicted infants, a greater number had group A blood than would have been normally expected (Table 2).

Blood group specific substance A is found in all human beings but there is a quantitative difference in the amounts present. Some persons of Group A may vary in the content of substance A by virtue of being homozygous or heterozygous for the A factor or of harboring one or more of the various subgroups of it. Others who are not of Group A almost always have the homologous anti-A agglutinin in their sera, therefore they must have in their tissues a source of specific group A substance as antigenic stimulus. Perhaps the quality or quantity of substance A is in some way related to the responses of the individual to antigenic stimulation, but of this there is no proof.

3. *Individual tissue vulnerability.* There is evidence to indicate that the immunologic responses of the individual may be conditioned by hereditary factors.[2] It is conceivable, and there are experimental data to fortify the opinion, that tissues vulnerable to antigenic substance may react in a qualitative or quantitative manner. At least there is abundant evidence to demonstrate that great variations in the degree of response to antigenic stimuli exist. In regard to *qualitative antigenic vulnerability*, there are some persons who are relatively reactive to all antigens, some who are relatively refractory to all antigens and some who become easily immunized to certain antigens and remain refractory to others. On the other hand, *quantitative antigenic vulnerability* is measured in terms of the individual titers of antibody responses, and these may vary

TABLE 2.—*The Percentage Distribution of ABO Blood Groups in a Selected Sample of Sensitized Rh-Negative Women Compared with Those of an Unselected Obstetric Population.*

ABO Blood Group of Mother	Unselected Sample of Obstetric Patients		Sensitized Rh-Negative Women		Sensitized Rh-Negative Women According to the Clinical Condition of the Rh+ Children Born to Them			
					Hemolytic Disease		Normal	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
	1,167*	100	170	100	120	100	50	100
O		45		35		33		40
A		39		49		54		40
B		12		12		10		16
AB		4		4		3		4

* 954 $Rh_0(D)$-positive + 213 $Rh_0(D)$-negative.

TABLE 3.—*The Occurrence of ABO Compatibility* in a Group of Sensitized Rh-Negative Women Compared to the Occurrence of ABO Compatibility in a Group of Non-Sensitized Obstetrical Patients.*

	Control Group Non-sensitized		Sensitized Rh-Negative Women		Sensitized Rh-Negative Women According to the Clinical Condition of the Rh+ Children Born to Them			
					Hemolytic Disease		Normal	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Total	1,167		170		120		50	
O Total	522	100	60	100	40	100	20	100
Compatible		**70**		88		**93**		80
Incompatible		30		12		7		20
A Total	466	100	84	100	64	100	20	100
Compatible		**94**		95		**97**		90
Incompatible		6		5		3		10
B Total	136	100	20	100	12	100	8	100
Compatible		**68**		90		**100**		75
Incompatible		32		10		0		25
AB Total	43	100	6	100	4	100	2	100
Compatible		**100**		100		**100**		100
Incompatible		0		0		0		0

*ABO compatibility between mother and child exists when the child is of the same A or B blood group as the mother, or is of Group O.

from high titers, demonstrable soon after exposure, to titers which remain persistently low despite many exposures to antigenic substance. There are some persons who react vigorously with a high titer to one antigen but do not give adequate response to another.

IMMUNOLOGIC HISTORY

Previous sensitization and antigenic competition both have a direct influence on the production of antibodies. Previous sensitization with any one antigen enhances the production of antibodies in the event that a second exposure to the same antigen occurs. This has been demonstrated many times in instances of Rh sensitization. For example, an Rh-negative woman who has had, in childhood, a transfusion or an injection of Rh-positive blood, will, on a second exposure to the same antigen (that is, in pregnancy), develop Rh antibodies much more rapidly than will an Rh-negative woman whose first exposure to the antigen is the current pregnancy.

The blood plasma may contain many varieties of antibodies and if any of them are actively rising in titer, they may exhibit the competitive effect against any further antigenic stimulation, especially if the new antigen is a weak one. If an Rh-negative mother is exposed to two or more antigens simultaneously, she may form antibodies to the stronger antigen first at the expense of the weaker antigen.[7, 14] The effects of the stronger A or B antigens, when competing with the weaker Rh antigens, are shown in relation to the production of hemolytic disease of the newborn—that is, the activity of the Rh antigen appears to be correlated with a higher incidence of disease when the A or B antigen is compatible in both mother and child and therefore not in competition (Table 3).

Since the ABO compatibility between mother and child occurs frequently in the group of mothers whose infants are afflicted with hemolytic disease of the newborn, it may be assumed that perhaps the lack of interference by the stronger A or B antigens allows a greater chance for the weaker Rh antigens to act, resulting in a more vigorous degree of Rh sensitization and a higher incidence of disease.[10] Since women of Blood Group A normally have a high incidence of compatible offspring (Table 3), this may explain in part the greater number of Group A subjects among sensitized Rh negative women (Table 2).

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Malignancies of the Skin

- PRECANCEROUS DERMATOSES—Samuel Ayres, Jr., M.D., *Los Angeles*
- CANCER OF THE SKIN—Harry J. Templeton, M.D., *Oakland*
- OTHER MALIGNANT CONDITIONS INVOLVING THE SKIN—Nelson Paul Anderson, M.D., *Los Angeles*

Precancerous Dermatoses

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EARLY diagnosis and prompt, effective treatment are accepted as the most important factors in the control of cancer. Since the skin is the most accessible organ of the body it is possible in many instances to recognize and destroy lesions which are potentially cancerous long before they have actually undergone malignant change.

Senile keratoses probably constitute the commonest of the precancerous lesions. They are usually found on the exposed parts of the body, such as the face and backs of the hands, and are due to a combination of three principal factors—a fair type of skin which freckles rather than tans, excessive exposure to the sun, and age. In average persons such lesions are first noticed in the age group above 50 and increase with increasing age. However, in people with very fair skins who burn and freckle rather than tan and who are excessively exposed to the sun, "senile keratoses" may develop during the third decade of life. Perhaps the term actinic keratosis would be a more accurate designation for this condition. It is believed by some that the keratosis represents an attempt on the part of the skin which lacks an adequate supply of pigment-forming cells to protect itself from ultraviolet radiation by thickening.

Having once developed, the senile keratosis usually persists indefinitely. At first the lesion consists of a barely perceptible dry, grayish, slightly rough or scaly lesion which may be detected more easily by palpation than by inspection. Such lesions usually occur on the face, nose, lower lip or backs of the hands. Patients often complain that the lesions are sensitive when rubbed or shaved over. During a period of months or sometimes many years the lesion gradually becomes larger, thicker and sometimes a little darker in color. Such lesions are usually non-inflammatory and when they do become inflamed it is often an indication that malignant changes are taking place. They may undergo malignant degeneration at any time; and when they do, they usually develop into squamous-cell epitheliomas which can metastasize.

The time to cure squamous-cell epithelioma of the skin, therefore, is in the precancerous stage, which means, first, that people with non-tanning skins should avoid heavy sunburns or excessive exposure to the sun; and, second, that every senile keratosis should be promptly dealt with. For lesions which are small (less than 0.5 cm.), superficial and non-inflammatory, the treatment of choice is freezing with solid carbon dioxide pencil, using firm pressure for 30 to 60 seconds and repeating at two-week intervals if necessary. If this is properly done, the lesions are eradicated completely with excellent cosmetic result. Lesions which are fairly thick, however, should be destroyed under procaine anesthesia by electrodesiccation and curettage to the point where curetting reveals normal tissue. If there is the slightest suspicion that malignant change has occurred, the entire lesion should be excised widely and deeply, using either the high-frequency cutting current or the scalpel, and the specimen submitted for microscopic examination. Radiotherapy properly carried out will also give satisfactory results.

Cutaneous horn or cornu cutaneum usually begins as a senile keratosis and represents an excessive hyperkeratosis. The lesion may be small and filiform or it may have a broad base and be an inch or two in length, sometimes forming a curve resembling a ram's horn. These lesions are potentially malignant and should be widely removed, preferably with the cutting current.

Chronic radiodermatitis is the name given to the changes occurring in the skin as the result of radiation injury from overexposure to x-rays or radium. This condition is definitely precancerous and exhibits all the appearances of prematurely aged skin with telangiectases, mottling due to pigmentation and depigmentation, and, in long-standing or severe cases, keratoses indistinguishable from senile keratoses and finally squamous-cell epitheliomas. Obviously proper understanding, care and precautions in the use of radiotherapy, as well as in fluoroscopic and roentgen diagnostic technique, are the most important elements in the prevention of this condition. Once the condition has developed, the involved area should be protected from excessive exposure to the sun and should be kept lubricated with a bland emollient. Incipient ulcers can sometimes be healed by the local application of the pulp of aloe vera or a vitamin A and D ointment. Keratoses should be

This trilogy was written in order to express opinions divergent from those set forth in chapters of the California Cancer Commission Studies dealing with malignant disease of the skin. The chapters were published in CALIFORNIA MEDICINE before they were assembled in book form.

destroyed by electrodesiccation and curettage, and fully developed epitheliomas should be dealt with thoroughly by surgical procedures. In some hands, the use of radon ointment has proved efficacious in the control of ulcerative lesions.

Seborrheal keratoses, seborrheal verrucae or senile warts are to be distinguished from senile or actinic keratoses. The latter usually develop on exposed areas such as the face and backs of the hands, whereas seborrheal keratoses are more liable to occur on covered areas such as the trunk and scalp although they may also occur on the face, especially along the temple areas. Seborrheal keratoses tend to occur in persons past the age of 40 or 50 who have oily skin, especially in the seborrheal areas. They are yellowish to brownish in color, have a warty-looking surface and are often covered with a greasy, mushy scale which can be easily picked or scraped off. These lesions rarely undergo malignant degeneration and if they do are more liable to develop into basal-cell epitheliomas. The seborrheal keratosis, if small or superficial, can be destroyed by freezing with solid carbon dioxide; if large, it should be treated by electrodesiccation and curettage.

Arsenical keratoses usually occur on the palms and soles but may develop elsewhere on the body. They follow the administration or accidental ingestion of inorganic arsenic in the form of Fowler's solution, probably also Asiatic pills, and contaminated drinking water such as may be found in certain mining areas. The keratoses may not develop until many years following the exposure to arsenic, but once they have developed they persist indefinitely. They may undergo malignant degeneration, usually developing into squamous-cell epitheliomas. Arsenical keratoses on the palms and soles consist of pinhead to split-pea sized corneous plugs. They are frequently associated with multiple superficial basal-cell epitheliomas on the trunk. If any of the keratoses tend to become enlarged or inflamed they should be destroyed thoroughly by means of electrosurgery.

Leukoplakia usually occurs at or past middle life in either sex but predominantly in men. It is characterized by whitish, thickened, discrete or confluent patches anywhere in the oral cavity. Local irritation from smoking, poor oral hygiene, rough teeth, dentures, or electrogalvanic currents between diverse metals in fillings, bridgework, etc., are important factors in causation. Hormonal changes, vitamin A deficiency, atrophic glossitis from vitamin B deficiency, and syphilis may be predisposing causes. Leukoplakic patches resemble senile keratoses and like the latter may degenerate into squamous-cell epitheliomas with rapid metastasis. Consequently, all thickened, indurated or ulcerated areas of leukoplakia must be subjected to biopsy. If the biopsy is negative the lesion can be destroyed by electrodesiccation and curettage, cautery, or excision. Contributing factors should be corrected. Large doses of vitamin A (150,000 units or more daily), sex hormones and vitamin B complex with dilute hydrochloric acid may be helpful in incipient cases. Leukoplakic changes may also involve the genital mucosa, especially the vulva.

Kraurosis vulvae or *atrophic vulvitis* leads to similar changes of the vulva involving both the cutaneous and the mucous tissues. The process is probably related to hormonal changes following the menopause. The condition begins with pruritus and some edema and redness, then after a period of months or years terminates in a whitish, sclerotic and atrophic condition which, if allowed to continue, frequently becomes squamous carcinoma. In early cases and sometimes even in advanced cases estrogenic hormone therapy both locally in the form of ointments or suppositories and internally may be very helpful. In cases in which the lesion is undergoing malignant change, vulvectomy is indicated.

Erythroplasia is a rare condition involving mucous membranes or mucocutaneous junction and is most commonly found on the glans penis. The lesions consist of one or more sharply circumscribed plaques with a red velvety surface and a tendency to slow peripheral extension. The danger of transformation into squamous-cell epithelioma calls for effective destructive procedures.

Bowen's disease presents a variable clinical appearance but a fairly characteristic microscopic picture. While it has been classified as precancerous, many authorities regard it as "carcinoma in situ" or early carcinomatous change within the epidermis. The lesions consist of chronic, slowly spreading plaques, patches or nodules. Thorough destruction is indicated.

Keloids, especially those following burns, lupus vulgaris, etc., have in rare instances been known to undergo malignant degeneration.

Cysts, such as sebaceous cysts, in rare cases have developed malignant tendencies.

Xeroderma pigmentosum is fortunately an uncommon condition which is congenital and familial. The person affected has a pronounced sensitivity to light, a condition which may become manifest in early infancy. Within a few years the skin undergoes senile-like changes such as a normal person would not show before the age of 70 or 80. By the age of puberty the skin is freckled, atrophic, and telangiectatic, and there are senile keratoses and epitheliomas. The lesions have to be dealt with as they arise and the patient must be protected from the sun as much as possible. The prognosis is poor and most persons who have the disease die at an early age from metastatic carcinoma.

Nevi of certain types are precancerous but do not come within the scope of this discussion and will be dealt with elsewhere in the symposium.

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Cancer of the Skin

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OF all cancers, those of the skin are most curable. Because of their accessibility for early diagnosis and treatment the cure rate, theoretically at least, should approach 100 per cent. The attainment of such perfection depends upon physicians being competent in early diagnosis, familiar with the method of treatment they plan to employ and, probably most important, sufficiently bold and radical to destroy every cancer cell at the time of the first treatment.

First in importance in the approach to skin cancer is a knowledge of the clinical appearance of the cutaneous malignancies, premalignancies and the dermatological entities which have to be differentiated. Although it is not within the province of this paper to describe all of these lesions in detail, a number of typical clinical photographs are shown here. If a physician feels that he has not had wide experience in the clinical diagnosis of skin cancer, he can still maintain a high degree of diagnostic accuracy if he depends upon a high index of suspicion and *microscopic examinations*. He should regard with suspicion all elevated and indurated lesions of the skin, particularly in elderly persons. Biopsy of such lesions is essential. Very small lesions should be removed *in toto* with a wide margin.

There is considerable difference of opinion as to the best treatment for skin cancers. Those who are highly skilled in this field develop their own methods and techniques of treatment such as electrosurgery, the actual cautery, scalpel excision, chemosurgery under microscopic control, x-ray and radium. The choice of the method to be employed will depend upon the skill of the physician and the kind of lesion to be treated. The author believes that, in general, complete removal of the lesion by means of one of the destructive methods is preferable in most cases to radiation therapy, although such therapy is indispensable in certain cases.

The various means of treatment mentioned, particularly x-ray and radium, are generally not available to most physicians who first observe patients with skin cancer. Moreover, not all physicians are acquainted with the use of these specialized forms of treatment. But this difficulty can be surmounted by recourse to a simple and satisfactory method of diagnosis and treatment available to all physicians, namely, excision with the scalpel. This procedure makes an accurate diagnosis possible and produces a very high percentage of cures if the physician is sufficiently radical at the first operation. An old rule advises that a margin of normal skin half as wide as the lesion itself be removed. A probably better one was that of Percy: "When you think you have removed a wide enough margin of normal tissue, take out some more."

Basal-Cell Epitheliomas

Squamous-Cell Epitheliomas

Melanoma

Since basal-cell epitheliomas do not metastasize to the regional lymph nodes it is never necessary to remove these nodes when dealing with this variety of epithelioma. There is some difference of opinion as to the advisability of prophylactically dissecting out clinically uninvolved lymph nodes in cases of squamous-cell epithelioma. In the author's opinion, such prophylactic node dissections should not be done in the ordinary squamous-cell epithelioma; some huge, fungating lesions might call for prophylactic node dissection. Of course, if the nodes are involved, or if there is even suspicion of their involvement, they should be removed at the time the primary lesion is removed.

There is no need to speak of different types and degrees of treatment for epitheliomas of different pathologic classification such as that of Broders. For if the rule of bold and wide removal of tissue at the initial operation is followed, all that is possible will have been accomplished, regardless of the type. And nearly all of the patients will have been cured.

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Other Malignant Conditions Involving the Skin

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BASAL-CELL carcinomas, prickle-cell carcinomas and precancerous skin conditions occur a great deal more frequently than do some of the other malignant conditions involving the skin. Nevertheless it is important to briefly discuss a few of these relatively uncommon malignant conditions.

Malignant melanomas (melanocarcinomas, melanosarcomas) are among the most malignant of all skin tumors. In general these develop from preexisting moles. The usual pre-melanotic mole is small to large pea-sized, appears to be imbedded in the skin, is non-hairy (although there are rare exceptions) and has a slate blue, blue-black or gunmetal color.

The signs of malignant change in such a mole are (1) increase in size, (2) increase in pigmentation, (3) the development of a crust, scale or small scab on the surface and (4) slight hemorrhage. The development of similar but smaller satellite lesions in the immediate neighborhood is of grave significance in prognosis because such lesions represent extension from an original lesion which is highly malignant. The gradual but steady development of a light to moderate brown macular pigmentation which extends peripherally in one or all directions from such a lesion is another phenomenon which represents a definite intra-epidermal extension of a highly malignant process.

Although malignant melanomas may occur on any area of the body, there are certain areas of predilection. These localities are the face, the portion of the foot covered by the shoe, and the subungual regions.

There are certain lesions which at times closely simulate malignant melanomas. These include pyogenic granuloma, pigmented basal-cell epithelioma, small subcutaneous angioma, irritated but benign pigmented nevi, the so-called blue nevus of Jadassohn, deeply pigmented seborrheic keratoses, and nodular subepidermal fibroma. Old hemorrhage in a cyst, callus or scar and traumatic tatoo marks from ordinary or indelible pencils or from ink must also be considered.

In most of these conditions, differentiation may be made clinically by an experienced observer, but if that is impossible, then it is imperative that the lesion be widely and deeply excised and that the material removed be examined by a qualified pathologist. If such a lesion proves to be benign, no further therapy is indicated. If malignant melanoma is present, wide and deep removal of the original site, including the underlying fascia, is indicated.

Multiple idiopathic hemorrhagic sarcoma (Kaposi): Generally starting on the feet or ankles, this neoplastic process presents bluish-red to purple-brown pigmented nodular lesions and plaques. These lesions vary in size from that of a pea to that of a lima bean or larger and present varying degrees of infiltration. At first they are usually found about the feet and ankles, less commonly on the hands. At the onset the lesions are generally discrete and multiple but later on coalesce to form infiltrated plaques. Still later similar, firm nodules develop on other parts of the body including the face, ears and trunk. In the final stages multiple, pigmented, hemorrhagic sarcoma involves the lymphatic system as well as various viscera.

The diagnosis should be confirmed by biopsy. Accepted therapeutic procedures are radiation therapy and the administration of arsenic.

Mycosis fungoides and the lymphoblastomas: There is a not inconsiderable group of neoplastic conditions which are termed the lymphoblastomas. These include mycosis fungoides, Hodgkin's disease, lymphosarcoma and lymphatic, myelogenous and monocytic leukemia.

Such disorders may originate primarily in the skin or they may start in the internal organs and involve the skin only secondarily. There appears to be a close relationship between the various members of this group, so close at times that an exact diagnosis as to type is not always possible.

In this group cutaneous lesions develop which may be non-specific in character. These non-specific skin lesions may be either local and relatively well circumscribed, or generalized. Thus the following non-specific cutaneous reactions may be found in association with the lymphoblastomas: (1) Herpes zoster, which is seen particularly in association with Hodgkin's disease. (2) Generalized pruritus which may exist with or without excoriations or with or without lichenification or thickening of the skin. Such a generalized itching is seen most frequently in Hodgkin's disease and must be differentiated from other conditions causing more or less generalized pruritus such as diabetes, nephritis, scabies, pediculosis, liver disease and bath itch. (3)

Pigmentation of the skin. (4) Generalized exfoliative dermatitis. This condition in some instances is non-specific but in most cases presents specific histopathological changes characteristic for the particular lymphoblastoma which is present. (5) A large group of ill-defined non-specific skin changes which resemble either psoriasis or eczema. Often the conditions in this group are seen in association with mycosis fungoides. (6) Urticarial skin lesions, bullous and pemphigus-like eruptions; fleeting, constantly changing and sometimes evanescent lesions belonging in the erythema group, as well as purpuric and hemorrhagic lesions. (7) Lesions of the mucous membrane with hemorrhagic, ulcerated or necrotizing features. These are seen especially in association with the acute leukemias.

Specific cutaneous changes also occur in association with the lymphoblastomas. Thus in Hodgkin's disease may be found solitary or multiple nodules or ulcers occurring in infiltrated plaques. Rare, however, is true Hodgkin's disease of the skin.

Frequently associated with mycosis fungoides are cutaneous lesions which have characteristics readily identifiable in microscopic examination but which clinically appear as a wide variety of lesions ranging from multiple definite cutaneous tumors of varying sizes and shapes to multiple plaques presenting more or less gyrate figures and simulating psoriasis or eczema. In rare instances the lesions may be tumors from the onset (the so-called d'emblée type). In other rare instances bullous or verrucous lesions may be present. In general the histopathologic picture is characterized by cellular infiltrate in the cutis composed of many different types of cells. Along with this are found pyknosis (shrinking with necrotic changes of the nucleus) and karyorrhexis (fragmentation of the nucleus).

In the various types of leukemias which involve the skin, whether they be of lymphatic, myelogenous or monocytic type, there occur variously sized purplish to violaceous cutaneous nodules. Mucous membrane lesions frequently involve the gums and are of purpuric or hemorrhagic character. Multiple large purplish plum-colored and plum-shaped tumor masses may involve the face. In rare instances ulcerated tumors develop. In nearly all cases hematologic studies are of value and may lead the way to a correct diagnosis. In other instances pathologic studies of the cutaneous lesions may reveal the type of leukemia long before any changes in the blood are noted.

So-called lymphosarcomas include varying types of pathologic processes. While the expert pathologist rightly attempts to classify these conditions, for practical purposes this group probably represents an end stage of the various lymphoblastomas previously described—nodules, plaques, generalized exfoliative dermatitis, and ulcerated lesions—they occur both with and without evidence of hematologic changes.

The diagnosis of lymphoblastomas as to specific type often requires the cooperation of the dermatologist, the pathologist and the hematologist. Frequent blood studies including studies of the bone marrow may be necessary. Even so there will be a considerable group of cases in which no definite diagnosis as to type can be made either during the life of the patient or at autopsy.

The treatment of the various types of lymphoblastoma is very unsatisfactory. X-ray therapy, the administration of nitrogen mustard, arsenic, antimony, chaulmoogra oil, and radioactive phosphorus —all are palliative. The best that can be said for any of the present methods of treatment is that they may make the patient more comfortable. This is accomplished by the relief of the itching, and the temporary alleviation of foul-smelling necrotic and secondarily infected tumor masses. Pressure symptoms may be temporarily relieved and the growth of the tumor retarded. In general, however, it is doubtful that any patients are cured or that life is appreciably prolonged.

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CASE REPORTS

- Chronic Relapsing Q Fever: Treatment with Streptomycin, Aureomycin, and Chloramphenicol
- Progressive Muscular Dystrophy Associated with Retinitis Pigmentosa

Chronic Relapsing Q Fever: Treatment with Streptomycin Aureomycin, and Chloramphenicol

JACK SHELDON CHUDNOFF, M.D., *Los Angeles*, and ALBERT G. BOWER, M.D., *Pasadena*

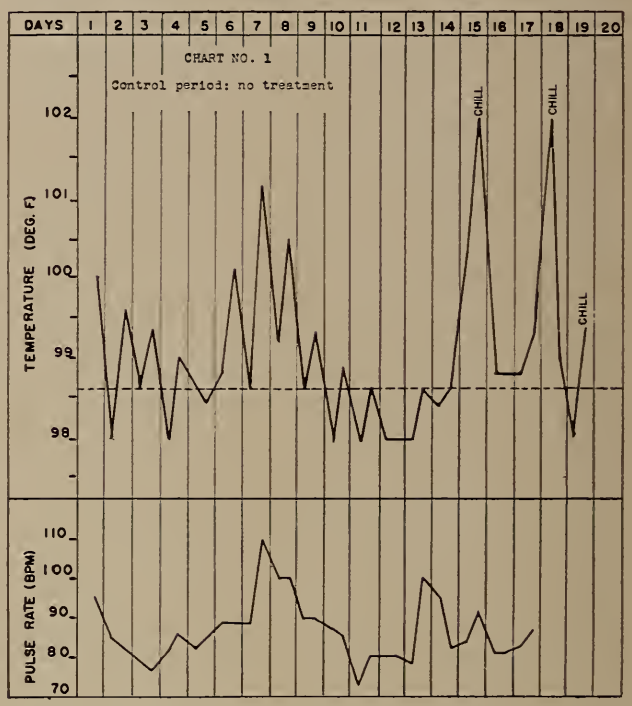
IN a review of the literature, no detailed report of chronic illness attributed to Q fever was found. There follows a description of such a case, which was studied minutely and at great length, although the record is necessarily shortened for publication. Since this case was studied, two additional less severe cases have been observed. Follow-up questionnaires of many patients seen in this area have led to the belief that prolonged asthenic states without actual chronic disease quite commonly follow attacks of acute Q fever.

CASE REPORT

A white male, 38 years of age, was admitted to the Los Angeles County General Hospital Oct. 13, 1948, with a history of recurrent episodes of "shaking chills with fever" for four days which had occurred some seven months previously. At that time, a physician had diagnosed a "flu" syndrome and prescribed a sulfa drug. After about five days, the patient had improved and was well for almost six months until Sept. 10, 1948, when the shaking chills began to recur daily. Fever recurred for more than a week, abated temporarily, then returned; it was associated with pain in the right calf and severe frontal headaches. At that time, an x-ray of the chest was normal. Agglutination tests for brucellosis were negative. The past medical history was irrelevant. The patient had gradually lost approximately 20 pounds in weight since Oct. 1947 for no apparent reason.

At physical examination upon admission, the patient was noted to be well developed and well nourished. The temperature was 100° F., the pulse rate 84 b.p.m., and the blood pressure 120 mm. of mercury systolic and 86 mm. diastolic. Small inguinal nodes were palpable, but there was no other evidence of lymph node involvement. The only other physical findings of note were a tender palpable liver, three finger-breadths below the right costal margin, and a barely palpable spleen.

The patient continued to have shaking chills each morning with fever to 100° F. The spleen gradually diminished in size. Only symptomatic treatment was given. On Nov. 12, 1948, the patient left the hospital with diagnosis not established, and without consent. Blood specimens had been sent to the National Institute of Health at Bethesda for special studies concerning Q fever, but no report had been received at the time the patient left the hospital. The patient returned to his home and soon afterward was visited by the local public health authorities because of two doubtful Kahn test reactions reported by the hospital to the local health department. During the course of the field investigation of the blood studies, reports were received from Bethesda that the complement-fixation reactions for Q fever were positive in a dilution of 1:64. Results of all other bacteriologic and serologic studies were negative.

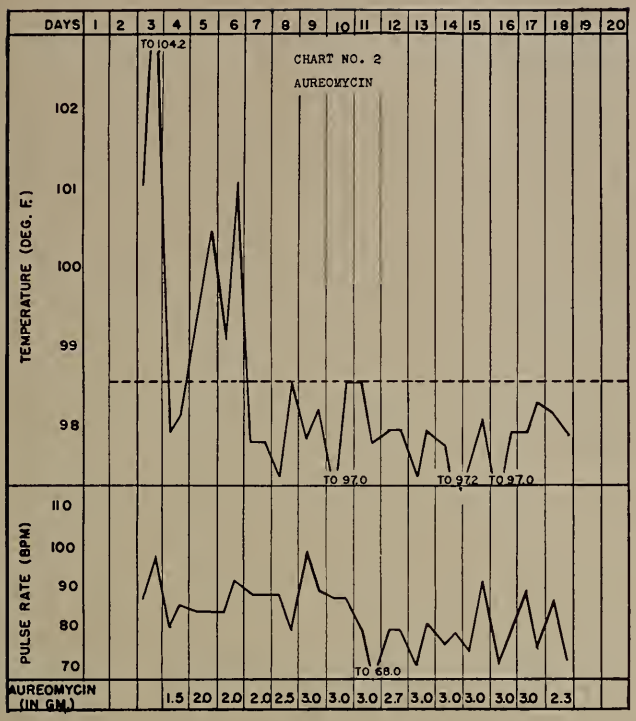


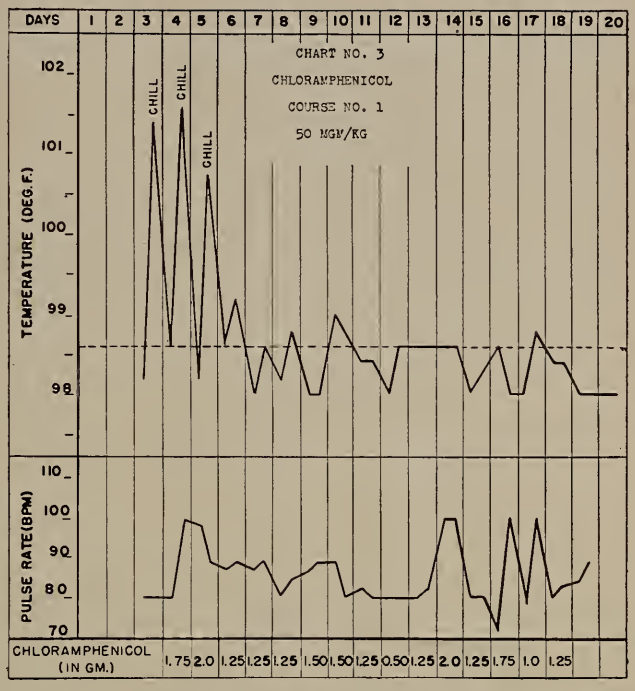
The patient was readmitted to the Communicable Disease Unit, Jan. 3, 1949, for treatment of Q fever. Since Nov. 12, 1948, he had had nightly sweats with fever of 102° to 103° F., but only two shaking chills. Chief complaints were fever, severe bitemporal headache, and generalized weakness. For a week preceding readmission there had been sharp sticking pains in the left upper quadrant of the abdomen upon deep breathing. The spleen was palpable three finger-breadths below the costal margin. On Jan. 4, 1949, an initial dose of 50 mg. of aureomycin per kilogram of body weight was given orally, followed by a total dose of 500 mg. every four hours. On Jan. 12, the aureomycin dosage was changed to 750 mg. every five hours. Approximately 72 hours after antibiotic therapy was started, the fever subsided and the temperature remained normal until the patient was discharged on Jan. 19, 1949. Prior to discharge, results of Kahn and Wassermann tests of the blood were again reported as doubtful. The albumin-globulin ratio was 3.8:5.3 gm. per 100 cc.

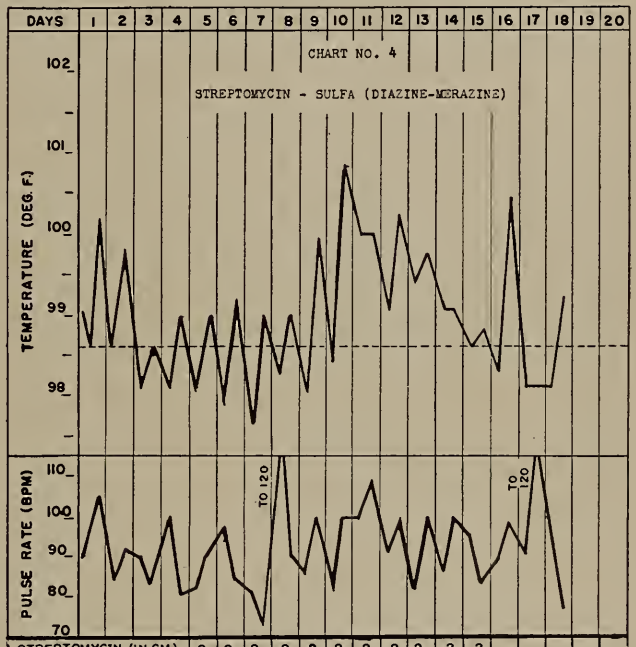
Q-fever complement-fixation titre was reported positive in dilution of 1:134 by the Los Angeles City Health Department and also by the California State Department of Public Health.

At the time of discharge the patient was clinically improved but there was evidence of residual hepatitis. After

From the University of Southern California School of Medicine, and the Communicable Disease Unit of the Los Angeles County General Hospital.







an interval of about two weeks, malaise and occasional backaches developed. At least every other night the temperature reached 101° F., accompanied by severe bitemporal headache. Feb. 9, 1949, the patient had a chill, the first shaking since returning home. He immediately reentered the hospital.

The spleen and liver were palpable approximately three finger-breadths below the costal margins. Because the relapsing course strongly suggested brucellosis, despite completely negative results of laboratory studies, it was decided this time to institute therapy with streptomycin and sulfadiazine. The patient received 1 gm. of streptomycin intramuscularly twice daily, and equal parts of sulfadiazine-sulfamerazine orally (initial dose 4 gm. followed by 1 gm. every four hours) for 11 days. The patient became afebrile in 48 hours, remained so two days, and then the temperature began to rise. Care was taken to maintain adequate concentration of the sulfa drugs in the blood. However, by the tenth day of treatment, fever rose to 101° F. and this treatment was discontinued.

At this time, chloramphenicol* became available for trial, and an initial dose of 50 mg. per kilogram of body weight was divided into three parts which were given in hourly doses. Following these doses, a daily total dosage of 50 mg. per kilogram was given, divided into equal portions on a two-hour schedule around the clock. After the patient became afebrile for 24 hours, the total 24-hour dosage remained on the basis of 50 mg. per kilogram, but was then given every four hours around the clock for an additional 14 days following the first afebrile day. Within 12 hours after the initial dose of chloramphenicol the patient volunteered that he felt very good, but 72 hours elapsed before he became afebrile. Fever did not recur. The patient remained asymptomatic from March 18 through April 1 when he was discharged to his home.

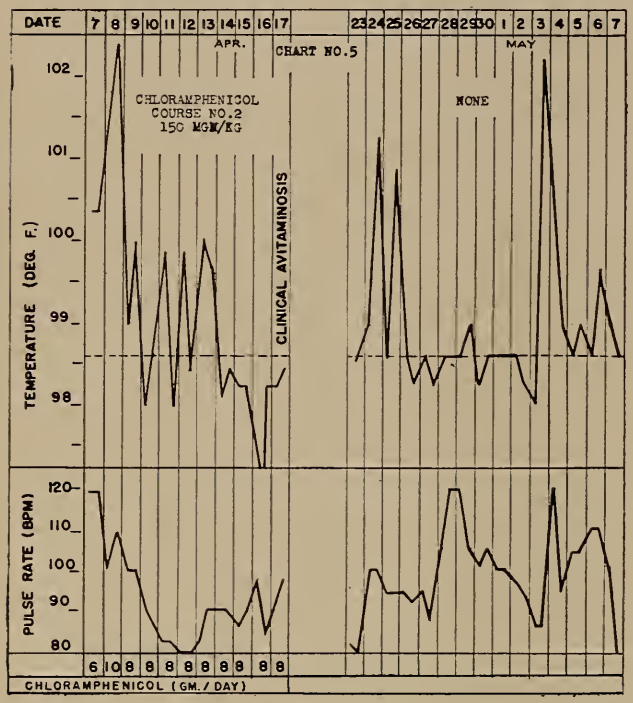
Again, the laboratory reported the results of repeated blood cell counts and urinalyses to be within normal limits. Repeated malaria studies, x-ray films of the chest, blood chemistry determinations, and numerous agglutination tests were non-contributory. The results of Kahn tests, however, were reported as doubtful on two occasions. Three hematocrit determinations showed packed red cells at 40, 37, and 38 per cent of the whole blood. Successive determinations showed albumin-globulin ratios of 3.7:4.3 and 4.1:5.5 gm. per 100 cc., respectively; the icteric index on three occasions never exceeded 10 units; thymol turbidity was 13 units, and the cephalin-cholesterol flocculation was 2 plus in 24 hours. Complement-fixation titres for Q fever were positive in dilutions of 1:520 (March 1), 1:1,032 (March 15), and 1:4,096 (March 31). The determinations were performed by the Los Angeles City Health Department with confirmatory specimens sent to the United States Public Health Service at Bethesda, Md.

During a week at home, the patient daily had fever to 103° F. with profuse nocturnal sweats and shaking chills. He reentered the hospital April 7 for the fourth time with

*The drug was made available by E. C. Von derHeide, M.D., of the Clinical Research Division of Parke, Davis & Co., of Detroit, Michigan.

temperature 100.4° F., pulse rate 120, and respirations 30 per minute. Splenomegaly, hepatomegaly, and a moderate degree of tinea cruris were present. The exanthem in the crural area had been present several weeks before and was now exudative. It was not given unusual consideration.

In view of the previous response, it was decided to use chloramphenicol again, this time in massive dosage on the supposition that previous amounts might have been inadequate and merely suppressive. The staff was not satisfied that the final diagnosis was completely established in this case, and the patient was completely restudied from a laboratory standpoint to ascertain if other entities were present in addition to the indisputable Q fever.



On April 7, an initial dose of 150 mg. of chloramphenicol per kilogram of body weight was divided into three parts and given with one-hour intervals. This was followed by 1 gm. every three hours for the ensuing 14 days. In 72 hours, the patient was subjectively well and completely afebrile. He noted light-headedness, not severe, and a very bitter taste in his mouth. The crural eruption was progressing unfavorably and was annoying. On April 11, prothrombin time (ascertained preparatory to peritoneoscopic visualization) was 49 per cent of normal (normal, 12 seconds). Vitamin K was administered intramuscularly in doses of 10 mg. three times daily. On April 17 there was a generalized, weeping, maculopapular, erythematous eruption, especially pronounced over the forehead, face and thorax; the tongue was beefy red; perleche was present; there was increased conjunctival vascularity and a necklace of erythema of the pellagrinous type. Severe multiple vitamin deficiency was obvious. Dermatologic consultation confirmed this diagnosis on April 20, and the patient was given heavy parenteral dosage of multiple-vitamin preparations. Local applications used until this time had been ineffectual and were stopped. Chloramphenicol was discontinued April 18, following the diagnosis of avitaminosis. After Vitamin K therapy for eight days, prothrombin time was 65 per cent of normal (normal, 14 seconds). Result of a simultaneous cephalin flocculation test was 1 plus in 24 and in 48 hours. The albumin-globulin ratio was reported as 4.1:4.8 gm. per 100 cc. The dermatitis responded rapidly to vitamin therapy parenterally. On April 28, 1949, peritoneoscopic examination was carried out and a biopsy specimen taken from the liver. The postoperative diagnosis based on a macroscopic visualization was hepatitis and subacute splenomegaly. Observations in microscopic examination of tissue sections were reported consistent with "mild cirrhosis, Laennec's type." Because there was still a question of differential diagnosis, especially regarding multiple myeloma or reticuloendotheliosis, serum protein studies by electrophoretic analysis were obtained, with the following report:

	Value (in %)	Normal (in %)
Albumin	30	55–60
Alpha globulin	15	15
Beta globulin	14	14
Gamma globulin	41	12

There was no pattern report which would strongly indicate any specific entity known. Extensive laboratory and roentgenologic data were again non-contributory with the exception of complement-fixation titres positive for Q fever. Complement-fixation titres had progressed to 1:4,096 (May 19), and to 1:16,384 (June 2, 1949).

After seven days of intensive chloramphenicol treatment, the patient was afebrile and felt well, although he had fever of 101° F. on the tenth and eleventh days after the drug was discontinued. Because the dermatitis remained, there was reluctance to resume therapy with any antibiotic which might suppress bacterial action in the intestines. The patient became apprehensive with the return of febrile episodes. Therefore, one of the members of the staff who was investigating the effects of ultraviolet hemo-irradiation by the Knott technique requested permission to treat him by this method. Accordingly, on May 15, 17, and 20, approximately 200 cc. of the patient's own blood was withdrawn, irradiated by the Knott technique and replaced. There was notable euphoria after each treatment. The patient had one sharp episode of fever to 102.4° F. on May 20, but thereafter remained afebrile. The effect of the hemo-irradiation remains a matter of conjecture. The patient was discharged from the hospital May 27, 1949, for follow-up care in the out-patient department. The final discharge diagnoses were:

1. Chronic relapsing Q fever.
2. Hepatitis (cirrhosis of the liver, mild, Laennec's type?)

At about the time the patient was discharged, a belated report was received of agglutination studies done for brucellosis by special technique which included not only removal of the blocking antibodies, but agglutination separately against B. abortus, B. melitensis, and B. suis. The results reported were: For B. abortus, positive in dilutions 1:20 through 1:160, weakly positive in 1:320, negative in 1:640; for B. melitensis, negative in all dilutions; for B. suis, negative in all dilutions.

DISCUSSION

The diagnosis of Q fever was not established during the first hospitalization of the patient, but it was suspected and the resultant positive complement-fixation report from the U.S.P.H.S. established it and indicated rehospitalization for further study and treatment. The second admission was for treatment only, and there was then no suspicion that the case was unusual in any way. By the third admission, Feb. 10, 1949, through April 1, 1949, the bizarre clinical course threw doubt upon the diagnosis, and the patient was subjected to the full scope of diagnostic and therapeutic procedures available. In spite of all efforts to uncover other causes for the illness, the only consistent finding remained a complement-fixation reaction positive for Q fever with a steadily rising titre to 1:16,384 (four plus in the final tube). This titre might have been even higher had the relatively more sensitive Italian antigen been used. While it is known that the complement fixation titre rises in most if not all cases of Q fever during convalescence, the clinical course

of this patient was not that of convalescence, but rather of repeated febrile relapses with each clinical relapse characterized by signs and symptoms usually associated with an initial attack.

Since the diagnosis of Q fever is unequivocally one of laboratory procedures alone, it was necessary to exclude other entities by extensive and repeated determinations. It was also necessary to contrast the clinical course of this illness with those of other entities in order to eliminate conditions for which there are no pathognomonic laboratory findings. If these criteria could be satisfied, the unique diagnosis of chronic relapsing Q fever could be substantiated.

The laboratory findings in clinical Q fever ordinarily revolve about two findings, viz.: pneumonitis and positive complement-fixation titres. In this case, there was at no time clinical or roentgenologic evidence of pneumonitis although x-ray films of the chest were taken six different times. The progress of the complement fixation titres is shown in Figure 6. Erythrocyte and leukocyte counts are usually within normal limits in the presence of Q fever, and they were in this case. Sedimentation rates, electrocardiograms, and cultures of the blood, stools, and urine were not of diagnostic significance. Spicknall[7] reported Coxiella organisms recovered in five of 45 attempts in other cases. In this case, attempts to recover the organism were not made until the fourth admission, and at that time inoculation into animals was unsuccessful. There are no reports of a positive reaction to a Kahn test in Q fever, but it is known that false positives or doubtful reactions may be associated with hepatitis, which was present in this case.

It is of interest to note the low positive agglutination titres obtained during the fourth hospital admission for Brucella abortus. This is in keeping with recent observations by Meyer and Eddie.[5]

CHART NO.6

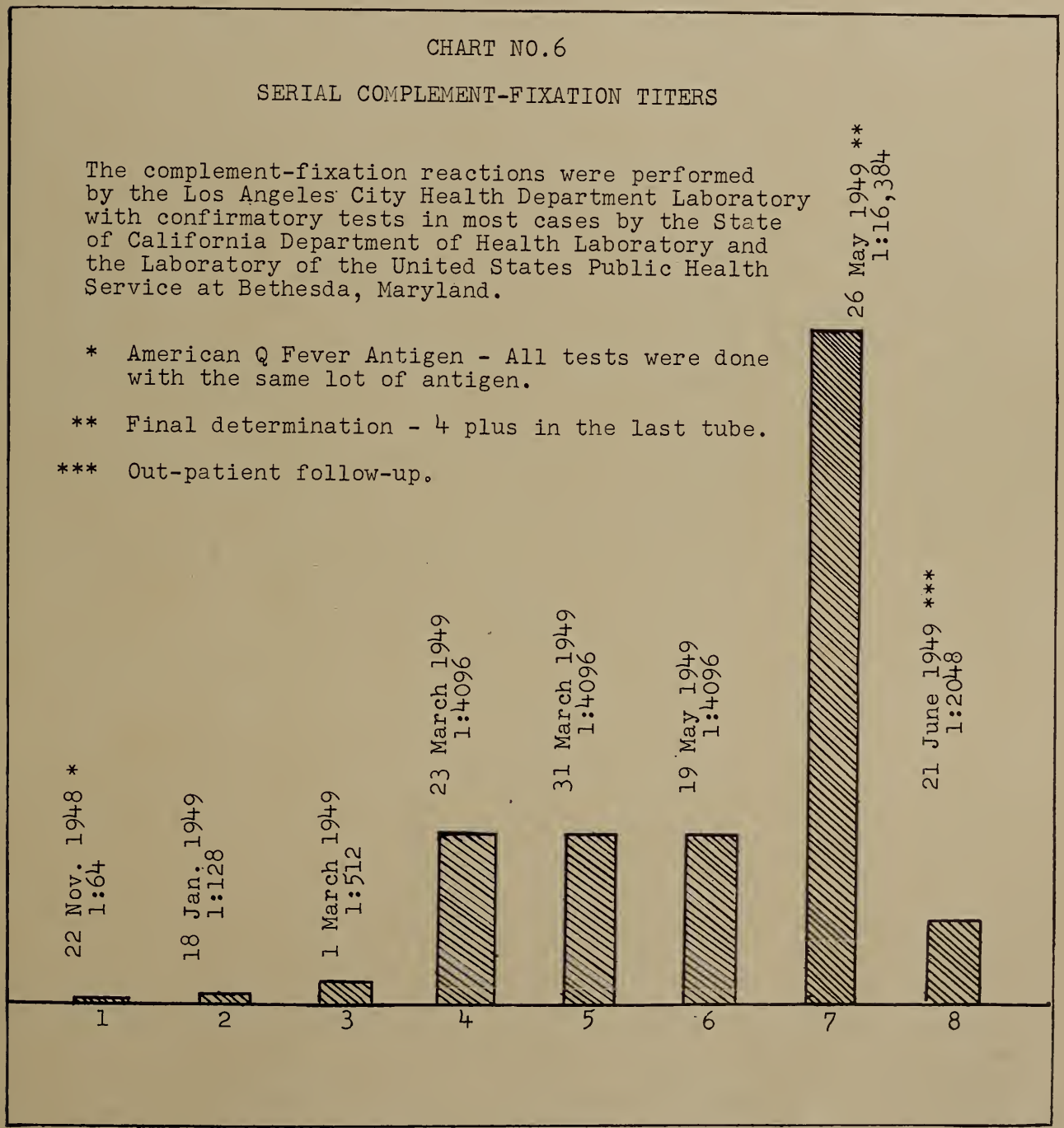
SERIAL COMPLEMENT-FIXATION TITERS

The complement-fixation reactions were performed by the Los Angeles City Health Department Laboratory with confirmatory tests in most cases by the State of California Department of Health Laboratory and the Laboratory of the United States Public Health Service at Bethesda, Maryland.

* American Q Fever Antigen - All tests were done with the same lot of antigen.

** Final determination - 4 plus in the last tube.

*** Out-patient follow-up.



The experience with antibiotic therapy was indeed unusual in that the patient appeared clinically to make a good response each time, only to relapse after therapy was stopped. Invariably, under each method of administration the patient became afebrile after 48 to 72 hours of treatment. Subjectively, improvement began even more quickly. In fact, there was virtually euphoria after chloramphenicol was started each time. When the second course of chloramphenicol was instituted with massive dosage, the patient complained of an extremely bitter taste, which can be explained by the fact that this antibiotic is excreted in the saliva within one and a half hours after ingestion.

The development of the classical skin manifestations of avitaminosis, plus the depression of the prothrombin time was not anticipated and, in fact, not recognized early. These occurrences are of much significance. It is apparent that when agents are used which tend to sterilize the bacterial flora of the gastrointestinal tract over prolonged periods, it may be necessary to supplement the treatment with vitamin therapy. In this case, rapid clinical improvement of all general and superficial avitaminotic manifestations occurred when such specific therapy was given.

After the third admission, on Feb. 10, 1949, intensive search was made to determine if more than one disease entity was present. It was known that the patient had hepatitis, but whether this represented a complication of Q fever or was an independent entity, was not known. The patient had never received plasma or blood prior to the present illness. There was never any visible icterus, but the liver and spleen were larger than normal and increased perceptibly in size with each severe febrile relapse. The differential diagnosis and the considerations therein are presented in Table 2.

In all probability, the clinical entity of Q fever has not yet been described in all of its possible variations. The criteria for diagnosis cited by pioneer clinical investigators in this country up to the present are:[1]

1. A four-fold or greater rise in the titre in successive blood specimens during convalescence is considered absolutely diagnostic of Q fever.

2. A single titre of 1:32 or greater during convalescence from an acute febrile illness of a nature clinically compatible with Q fever is considered strongly presumptive of the disease.

In the case here reported, both criteria were met.

The original description of the Australian cases was characterized strikingly by the absence of pneumonitis.[3] It has been present rather consistently in American cases—in 13 of 45 cases of one series,[7] and in 50 of 80 cases in a second series.[1] Absence of pneumonitis, therefore, is not unusual. Its presence, however, is most helpful in suggesting the diagnosis during the initial phases of an illness.

The average incubation period reported is 16 to 18 days, with a range of 13 to 32 days. Although the patient in the case here reported dated the onset of illness to March 1948, it appears more likely that the actual infection occurred

Table 1.

Signs and Symptoms Reported in Q Fever from Literature

Symptoms:	(Series of 45 cases[7])	(Series of 80 Cases[1])	Signs and Symptoms in Patient
1. Headache	34	not tabulated	1. Present. With each febrile relapse.
2. Generalized aching	20	10	2. "Flu-like" aching with each relapse.
Arthralgia	0	5	
3. Cough	15	50	3. Absent.
4. Chest pain or discomfort	12	29	4. Absent.
5. Nausea or vomiting	10	26	5. Nausea with each relapse; vomited once.
6. Anorexia	not tabulated	42	6. Present.
7. Burning of eyes	6	3	7. Absent.
8. Bloody sputum	5	not tabulated	8. Absent.
9. Abdominal pain	3	4	9. Epigastric and left upper quadrant pain present.
10. Diarrhea	2	4	10. Absent.
11. Constipation	2	not tabulated	11. Present.
12. Epistaxis	2	not tabulated	12. Absent.
13. Sensitivity of skin	1	4	13. Erythema of forehead and neck with febrile relapses. Tinea cruris.
14. Other	0	0	14. Pain in right calf, second admission.
Signs:			
1. Chills or chilly sensations. Sweats	32	67	1. Bed-shaking chills with febrile episodes.
2. Rales	11	47	2. Absent.
3. Fever without chills or sweats	10	(Fevers 80)	3. Fever with chills and sweats.
4. Abnormal breath sounds in chest	5	21	4. Absent.
5. Conjunctivitis	5	6	5. Absent.
6. Dullness on percussion	4	21	6. Absent.
7. Incr. vocal fremitus	4	not tabulated	7. Absent.
8. Dyspnea	3	not tabulated	8. Absent.
9. Cyanosis	2	not tabulated	9. Absent.
10. Delirium	2	13	10. Absent.
11. Rash	1	4	11. Erythema of face and forehead with fever.
12. Incontinence	1	not tabulated	12. Absent.
13. Palpable liver	not tabulated	3	13. Present.
14. Palpable spleen	not tabulated	2	14. Spleen definitely enlarged.
15. Lymphadenopathy	not tabulated	13	15. Absent.
16. Meningeal irritation	not tabulated	20	16. Absent.

approximately Sept. 10, 1948. At that time, the acute phase began, recurring periodically throughout four periods of hospitalization. The complement-fixation titres increased progressively. The initial positive complement-fixation titre was obtained shortly after the first hospital admission. The usual duration of illness or infection before the appearance of a positive titre is 10 to 14 days.[3]

Six cases in which the patients had relapse following apparent recovery from Q fever have been reported.[2, 4] Heubner and co-workers[3] mentioned a case in which there was complete repetition of the clinical course after a five-day course of treatment with streptomycin. Derrick and Burnet[2] reported one case in which there was a daily rise in temperature for nine weeks after onset of Q fever. The course of illness in that case was approximately nine months.

Sequelae of phlebothrombosis, pains in the legs, edema in the ankles, persisting hiccups, and peripheral claudication have been reported in the literature and have been observed by the authors. The presence of hepatitis as a complication or sequel has not been reported previously.

According to Huebner, significantly high complement-fixation titres have been obtained as long as six years after recovery. In the case here reported, the titre continued to rise progressively with each relapse. With the exceptions of Rocky Mountain spotted fever and brucellosis,[5] no human illnesses have been found to produce serum components capable of giving a positive reaction in the Q fever complement-fixation test.

In the treatment of Q fever, sulfonamides and penicillin have been used singly and in combination, with no perceptible effect. Streptomycin has been reported of value in experimentally induced infections and in isolated clinical instances.[6] Aureomycin is of benefit in human infections.[4] Para-aminobenzoic acid in adequate doses was of no benefit in three reported cases.[1] To the present, there are no reports available concerning the use of chloramphenicol in Q fever. At the time it became available, there was no information concerning optimal dosage and the procedure employed was of a pioneering nature, guided only by clinical judgment and by the information from the manufacturer, who suggested that the dosage originally employed in the pilot studies on scrub typhus be used.

In spite of the fact that the patient remained febrile, a noteworthy feature was the pronounced change in attitude and the feeling of well-being within 24 hours after this antibiotic was given. This euphoric state, however, also occurred when aureomycin was given. Following the relapse after the initial treatment with chloramphenicol, it was decided to use it in massive dosage to rule out inadequate therapy. The second time, the patient noted light-headedness at once, but it was not troublesome enough to warrant discontinuing the therapy. He complained increasingly of a bitter taste which precluded enjoyment of food or drink.

It was midway during this intended 14-day course of treatment that the dermatologic aspects of severe avitaminosis became evident, and for that reason all therapy was stopped. In retrospect, it must be pointed out that following the second hospital admission on Jan. 3, 1949, the patient intermittently received many successive therapeutic agents which are known to sterilize the bacterial content of the gastrointestinal tract. By April 17, 1949, after more than three months of such therapy, avitaminosis was clinically apparent, although the patient was eating an average amount of the usual hospital diet. Unfortunately, the only laboratory determinations—assays, in a sense—which were made to corroborate avitaminosis were the prothrombin-time determinations. That there was associated hepatitis either complicating the Q fever or concomitant with it is unequivocal. It is felt, nevertheless, that the prothrombin time depression was affected by the additional factor of avitaminosis secondary to gastrointestinal bacterial sterilization.

It would appear from this experience that at least two important facts concerning chloramphenicol were brought into clinical focus: The antibiotic is low in toxicity for humans and can be given in relatively large doses comparatively safely; it is wise when chloramphenicol or other similar agents are being administered to use supplements of multiple vitamins especially if therapy is prolonged.

There are at present insufficient autopsy data regarding Q fever to ascertain the anatomical site of Coxiella localization. Despite apparent response to therapy in this case, it is equally apparent that auto-immune mechanisms very probably are required for the eventual suppression. The steady progressive rise in complement-fixation titres is supportive of such a conclusion. Unquestionably, judging by the fever charts, antibiotics can be suppressive and, in many cases, even curative. The latter alternative has been the sole idea

Table 2.—*Chronic Relapsing Q Fever*

Conditions Considered in the Differential Diagnosis	Observations and Procedures Used to Include or Exclude This Diagnosis During Four Hospital Admissions:
1. Influenza	1. Length of febrile illness. Serology not attempted.
2. Sinusitis	2. Two series of sinus x-rays. ENT consultations.
3. Malaria	3. Fifteen series of blood smears in all phases of fever. Epinephrine test.
4. Rheumatic fever	4. Two electrocardiograms; 3 sedimentation rates. Clinical picture.
5. Typhus fever	5. Agglutination for OX-19 four times.
6. Brucellosis	6. Blood cultures under special condition, 8; agglutination studies, including those with removal of blocking antibodies, 8.
7. Typhoid fever	7. Blood cultures, 8; stool cultures, 4; urine cultures, 2; agglutination, 6.
8. Psittacosis	8. Complement-fixation, 1. Clinical course.
9. Tuberculosis	9. Skin test positive; chest x-rays, 6.
10. Coccidiomycosis	10. Skin tests, 2—both positive; complement-fixations, 3—all negative.
11. Histoplasmosis	11. Skin tests, 2—both negative.
12. Multiple myeloma	12. Urinalysis, 32; bone marrow studies, 2; body x-rays, 1 complete series. Electrophoretic analysis of serum proteins.
13. Reticuloendotheliosis	13. Bone marrow aspirations, 2; x-rays of bones.
14. Hodgkin's—giant follicular lymphoblastoma, etc.	14. Bone marrow studies, 2; chest x-rays, 6; lack of adenopathy.
15. Lupus erythematosus-periarteritis	15. Urinalyses, 32; complete blood counts, 23.
16. Infectious mononucleosis	16. Heterophil agglutination titres with sheep RBC, 4; blood smears, 12.

up to the present; the former is a relatively newly discovered fact in its relation to the entity of Q fever. Again, a parallel may be made to the history of infectious mononucleosis which only in recent years has become appreciated as a malady of long duration following the subsidence of acute manifestations. Certainly no specific claims of superiority for treatment can be made in this case for streptomycin, aureomycin, or chloramphenicol, since each appeared to be suppressive at least temporarily. It is highly probable that the results of therapy predicated more from the duration of treatment plus continually and increasingly effective auto-immunity than from any specific therapeutic agent utilized.

FOLLOW-UP NOTES

The patient was observed as an out-patient in December 1949, seven months after final discharge from the hospital. He stated that except for pains in the calves of the legs, and ease of fatigue, he had been well since leaving the hospital. The latest blood complement-fixation titre for Q fever (Jan. 18, 1950) was found to be positive in dilutions of 1:2,048 (four plus in final tube).

The patient was seen in July 1950, and stated that he felt well. He stated that his hearing was not as good as it had been before his illness (streptomycin?) and that he still tired easily and had aching in the calves of the legs.

SUMMARY

A case of chronic relapsing Q fever of approximately nine months' duration is reported in detail. Each clinical relapse was characterized by the signs, symptoms, and laboratory data commonly reported in cases of Q fever in humans; each relapse was clinically similar to the preceding phase. Therapy included the use of streptomycin, sulfonamides, aureomycin, and chloramphenicol. Pertinent findings which occurred during therapy are described and discussed especially with relation to prolonged duration of any antibiotic therapy which may have as a side-effect a tendency toward bacterial suppression in the gastrointestinal tract. Reference is made to the fact that the organisms of Q fever produce not only acute clinical entities but also are capable of persistent localization within the body in a manner reminiscent of malarial parasites, and that, in all probability, autoimmune mechanisms are of at least equal importance to antibiotic or other therapy in the eventual cure.

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Progressive Muscular Dystrophy Associated with Retinitis Pigmentosa

Martin H. Reinberg, M.D., *Los Angeles*

PROGRESSIVE muscular dystrophy and retinitis pigmentosa have been separately found associated with disorders of the endocrine system. The precise relationship between progressive muscular dystrophy and endocrine disturbance is not known. Attention has been called[5] to the occasional association of myopathic dystrophies with various endocrinopathies such as gigantism, stunted growth, acromegaly and dystrophia adiposogenitalis. Thyroid disturbance,[1] parathyroid insufficiency,[9] changes in the pineal gland[11] and pluriglandular abnormalities[2] have also been noted, as have hypoglycemia and deficient glycogenesis.[5, 6] Ironside[5] stated that the inherited defect responsible for the development of muscular dystrophy may also be the cause of the endocrine disturbance of secondary and less important nature.

In a series of 36 cases of primary myopathy, Hurwitz[4] noted thyroid enlargement, a small sella turcica, undescended testes and adiposogenital dystrophy, but felt that the changes were too infrequent to assume an endocrine disturbance as the cause of muscular dystrophy. He showed, however, that altered carbohydrate metabolism occurs in the majority of patients with dystrophy. Similarly Wilson, [13] while noting the frequency of hypoglycemia and deficient glycogenesis, attributed the presence of endocrine disturbances to coincidence.

Several studies on retinitis pigmentosa suggest pituitary dysfunction may play an etiologic role.[6, 7, 10, 12] Moehlig and Pino[8] found high-arched palate in 100 per cent of 21 patients with retinitis pigmentosa, 14 per cent of whom were offspring of consanguinous parents. They related high arching of the hard palate to disturbances in its common embryologic development with the pituitary. They also pointed out the close embryologic and anatomical associations between the pituitary, hypothalamus and retina and felt that pituitary function is involved in retinitis pigmentosa.

In Givner's and Bruger's series[3] of 14 patients with retinitis pigmentosa, 11 had creatinuria (eight were males). There was a high incidence of nerve deafness and of high-arched palate. They reviewed the literature and concluded that the disease is hereditary and due to autonomic and endocrine dysfunction. Wortis and Shaskan[14] found consanguinity in 6 per cent and deafness in 44 per cent of 41 patients with retinitis pigmentosa. There were associated changes such as persistent amenorrhea, polydactylism, obesity and thyrotoxicosis. They felt that retinitis pigmentosa is only a sign of a more generalized disturbance.

Paget's disease, chronic occlusive arterial disease and various nervous and ocular disorders have been described in connection with pigmentary degeneration of the retina. A review of the literature has disclosed no case of progressive muscular dystrophy associated with retinitis pigmentosa. For this reason and because of the possible relation of each of the two disorders to endocrine disturbance, a description of a patient with both diseases was thought to be of interest.

CASE REPORT

A 68-year-old unmarried white male entered the Los Angeles County General Hospital on June 9, 1948. From very early childhood he had been unable to see at night except for distinguishing light from dark. Vision was apparently normal during the day. Sight progressively became poorer, terminating in blindness in 1940.

From the Los Angeles County General Hospital.

In early childhood, the patient had an "unusually erect back." As a boy his biceps were very small. The calves appeared and felt normally muscular. At about the age of 16, weakness of the arms and especially the legs became prominent and the legs gradually grew thin. At first he could not run. Later he stumbled when walking. He was able to stand on his toes but could not raise his legs or climb stairs. In order to rise, it was necessary to pull himself up with the aid of the hands and arms. He continued in his occupation as a "press feeder" until the age of 20, when weakness forced him to stop working. There was slow progression of muscular weakness until, at the age of 60, the patient became bedridden.

He had never noticed muscle twitching, numbness, tingling, or disturbances of speech or swallowing. His last measured height was 5 feet four inches.

Family History: The patient's parents were not consanguinous. Otherwise, there was no information about the father or the father's family. Little information regarding the mother was obtainable except that she had "very weak back muscles." She died at a second childbirth, the infant being stillborn. The mother had had five siblings, one of whom also had a "weak back." None had eye disease, goiter or known endocrine disturbance. The maternal grandmother died of old age and the maternal grandfather of diabetes mellitus.

Physical Examination: The patient was a poorly developed, poorly nourished, intelligent, alert, white male of 68 whose temperature was 98.6°F., pulse rate 80, respirations 18 and blood pressure 150 mm. of mercury systolic and 90 mm. diastolic.

The pupils were round and slightly irregular; the right measured 5 mm., the left 4 mm. Both reacted sluggishly to light directly and consensually. There was bilateral total blindness. The extraocular movements were normal. Retinal examination, as described by a member of the department of ophthalmology, revealed "optic discs pale and cups deep with secondary type of atrophy. Fundus vessels very attenuated, especially the arteries. Large amorphous accumulations and smaller bone-corpuscle-like accumulations of pigment seen scattered about the fundus. Much choroidal sclerosis; choroidal vessels very prominent. Impression: retinitis pigmentosa."

The palate was not high-arched. Hearing was unimpaired. The thyroid was not palpable. Lumbar lordosis and scoliosis were present. There was no pronounced hirsutism.

The sternocleidomastoid muscles were atrophic, with pronounced bilateral weakness. There was inability to raise the head but fairly good ability to push the head backward. The shoulders could not be raised. In the upper extremities there was moderate atrophy of all muscle groups, but especially the proximal ones. The grip was very weak bilaterally. There was ability to move the fingers and wrists, though not freely. By means of a rapid "crawling" of the fingers up the chest, the patient moved the forearms. He could not move the arms. Partial flexor contractures at the elbows and moderate ulnar deviation of the hands were present. There was moderate atrophy of the thigh and leg muscles, especially the former, with inability to move the lower extremities except the toes. Bilateral "clawfoot" contracture was present. No fasciculations were noted. Sensation was intact except for slight hyperesthesia of the feet and ankles. All deep and superficial reflexes were absent. There were no signs of pathological changes in the toes.

Laboratory Data: The content of blood iodine was normal (6.5 micrograms). An oral glucose tolerance test (Folin Wu method) showed a fasting blood sugar level of 68 mg. per 100 cc. with a maximum rise to 137 mg. per 100 cc. in one hour and a return to 100 mg. in four hours. The hemogram and concentration of serum proteins were normal. Reactions to tests of the blood and spinal fluid were negative for syphilis.

Creatine and creatinine content of the urine were 0.46 gm. and 0.06 gm., respectively, in a total 24-hour urine volume of 760 ml. The electroencephalogram was moderately abnormal throughout. The basic rhythm was 8 per second and the amplitude 40 to 60 mv. In addition, 6 to 7 cycle per second waves were recorded diffusely.

Roentgenological studies of the lungs showed no abnormality. Films of the feet and knees showed pronounced atrophy of disuse with contracture deformity of the feet, apparently secondary to a neurological lesion. The skull showed no evidence of bony or intracranial disease. Diffuse osteoarthritis with some scoliosis of the spine was present, with bridging between some of the vertebral bodies and a congenital defect in the lamina of the first sacral segment.

Electromyographic samplings showed no muscle action potentials recorded from the right biceps, normal motor units recorded from all areas of the right opponens pollicis, and no normal units recorded from the left quadriceps. No fibrillations or fasciculations were noted. The impression was quantitative reduction of motor units only. No evidence of neuronal disease was developed. The findings were compatible with primary muscular disorder.

*Muscle biopsies:** "Section of rectus muscle: areas of fatty infiltration separated small bundles of musculature. A few of the muscle fibers appeared smaller than normal and were apparently in a stage of atrophy, although the usual appearance of hypernucleosis was not seen. Around some of these atrophic fibers there were areas of fibrosis. Most of the muscle fibers were, however, normal in size and appearance. Cross striations were distinct and nuclear content was not increased. Section of left biceps muscle: it was extremely difficult to find any recognizable skeletal muscle. Instead, there were areas of fibrosis having an irregular pattern and containing linear to globoid masses of adipose tissue. An occasional strand of acidophilic stained tissue probably represented remnants of skeletal muscle. Here and there was noted a group of nuclei, apparently the remnants of sarcolemma.

"Histological diagnosis: Primary muscular dystrophy with extreme atrophy and fibrous replacement of muscle."

COMMENT

The coexistence of progressive muscular dystrophy and retinitis pigmentosa may be merely fortuitous. The fact that the two disorders have not been reported together previously suggests this possibility. Abnormal creatine and creatinine excretion in the urine, which was shown by this patient, is not specific for muscular dystrophy. There was neither a high-arched palate, nor deafness, nor a history of consanguinity. It is interesting, moreover, that in a patient with two diseases, each of which in certain instances has been associated with pituitary dysfunction, nothing more suggestive of endocrine disturbance than a low fasting blood sugar could be demonstrated.

SUMMARY

Literature was cited which suggests the relationship of progressive musclar dystrophy and of retinitis pigmentosa to pituitary disturbance.

A case in which both disorders were combined, but in which no clinical evidence of endocrinopathy was demonstrated, has been presented.

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EDITORIAL

War and Doctors

War in Korea has pointed up the need for additional fighting men and, with them, additional medical officers. Doctors are more in demand than are members of other professions and groups, and many of them are today asking when their turns may come and, if so, by what means will they be called.

In World War II the country was plunged into all-out war on December 7, 1941. In the present conflict the United States is acting as the standard-bearer for the United Nations, presumably the spearhead force for an international police contingent expected to encompass elements from the armed forces of a score of countries. In these circumstances there is bound to be a totally different philosophy abroad than in the late days of 1941 and the months immediately following.

Added to the philosophical consideration is the fact that today there are many more physicians serving in reserve status with the armed forces than there were prior to Pearl Harbor. Many more are subject to call and are considered as qualified veterans.

In the circumstances many doctors are today asking if there is not some equitable order of going, so that those who served their country in the last war and are just now regaining their professional and economic status after that sacrifice may not be immediately called upon for a further period of service. Is there not, they ask, some logical means of spreading the burden among all of us? This question has led to the formation of groups in some states to provide an orderly system of medical officer recruitment. It has brought forth an official declaration by the A.M.A. House of Delegates and similar declarations by medical groups in the states and counties. Most recently it has resulted in the introduction of H.R. 9311 in Congress (the author: Representative Saylor of Pennsylvania) to call for an order of priorities in the recruiting and assignment of medical officers for the three branches of the armed forces.

The consensus in all quarters seems to be completely in accord with the resolution adopted by the House of Delegates of the A.M.A., which provides essentially: The priority for recruiting medical officers shall call for (1) those recent graduates who received part or all of their medical education at federal expense and who have not completed their required tour of duty *and* those who furnished their own funds for their medical education but were deferred from active duty because of their student status; (2) other physicians who did not serve in World War II, and (3) those physicians who served the least in World War II.

These priorities, with conditions of age, infirmity or absolute irreplaceability considered, appear to be pretty generally accepted in medical circles throughout the country. The logic of this order of service seems to be irrefutable.

Factually, the armed forces are now aiming at a total force of about 2,000,000 men. Military tables of organization now call for 3.6 medical officers per 1,000 men, or a total of 7,200 physicians for this force. A recent call for the voluntary enrollment of 3,000 medical officers brought forth only 200 volunteers.

The medical profession was signally honored in World War II in being permitted more or less to write its own ticket. Through Procurement & Assignment Service it was allowed to divide up its own resources for the good of the nation, and it is pretty

generally conceded that it did a good job. Now, with another international situation already under way, the profession will certainly be given a heavy responsibility, whether or not it is granted authority similar to that given in the last conflict. The question of reestablishment of Procurement & Assignment Service has not yet been answered officially; to date we do not know if this or a similar self-governing authority is to be set up. We do know, however, that the Council on Emergency Medical Service of the A.M.A. has been working most harmoniously with federal officials for several years. We also know that the leaders of the armed forces are fully aware of the need of complete cooperation with medical organizations and have done their utmost to extend such cooperation.

The medical profession today has an obligation to meet—the absolute necessity of seeing that the country's armed forces are properly supplied with qualified medical officers. Government can use its powers to draft doctors; Congress can pass laws to make specially trained citizens, including physicians, subject to a call to military duty beyond that required of other citizens; the armed forces can invoke mandatory calls to duty for reserve officers who have already been called upon for service in the last war.

With all of these considerations in sight, the wise course would seem to be for the medical profession to solve this problem before governmental agencies have even slight warranty to step in with force. Organized medicine should start at once to influence its members in the Number One category to volunteer their services. If this category is exhausted and a need still remains, the second group should be called upon. Finally, the third group should be influenced to serve, if the need goes that deep. In any event, this is a job for medicine, not government, to do.

CORRECTION

In the editorial "The Hess Report and What It Means," which appeared in the August issue of CALIFORNIA MEDICINE, a typographic error occurred.

The first sentence in the ninth paragraph was printed: "Thereafter, the American Hospital Association in March 1950, in a distributed brochure, quoted resolutions defining that in its opinion radiologic, pathologic, anesthesiologic and psychiatric departments are component parts of the hospital organization and are included properly in a 'patient-day' of hospital care."

The word *psychiatric* should have been *physiatric.*

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California Medical Association

Revised Proposed Constitution Submitted by Reference Committee No. 3, April 30, 1950

Herewith is printed, for the first time in CALIFORNIA MEDICINE, *the proposed C.M.A. Constitution introduced in the 1950 House of Delegates by Reference Committee No. 3 of that body. A second printing, in accordance with existing constitutional provisions, will be made prior to the convening of the 1951 House of Delegates in regular session.*

Included in this document is an additional proposed section introduced by Reference Committee No. 3 as an addendum to its original introduction of the proposed Constitution.

Members of the Association, and especially members of the House of Delegates, are urged to give this proposed Constitution a thorough study. It contains various provisions which are different from existing constitutional provisions and which have been under discussion in the House of Delegates in the past.

CONSTITUTION

ARTICLE I.—NAME, PURPOSES AND ORGANIZATION

Section 1.—Name

The name of this organization is California Medical Association (hereinafter referred to as the Association).

Section 2.—Purposes

The purposes of this Association are to promote the science and art of medicine, the protection of public health, and the betterment of the medical profession; to promote similar interests of its component societies; and to unite with similar organizations in other states and territories of the United States to form the American Medical Association.

Section 3.—Organization

This Association has two divisions: One, the Association as an organization; and Two, the Scientific Assembly. The Association as an organization includes component societies and their active members, the House of Delegates, Council, Commissions and Standing Committees. The Scientific Assembly includes all members of the Association and the scientific sections.

Section 4.—Definition of Component Societies

Component societies include all county medical societies (which may cover one or more counties) heretofore or hereafter chartered by this Association.

Section 5.—Component Society Charters

Charters to component societies may be granted and revoked as hereinafter prescribed, subject to the limitation that only one charter may be outstanding at any one time in any county.

ARTICLE II.—MEMBERSHIP

Section 1.—Classes of Members

The members of this Association shall consist of Active, Associate, Honorary, Retired, Life and Affiliate members.

Section 2.—Membership Qualifications, Rights, Privileges, Duties and Method of Election

The qualifications, rights, privileges, duties, obligations and methods of election of the several classes of membership are as stated in the By-Laws.

ARTICLE III.—GOVERNMENT OF THE ASSOCIATION

Part A.—House of Delegates

Section 1.—Composition

The House of Delegates shall consist of:

(a) Delegates elected by the members of component societies;

(b) Officers of the Association as hereinafter provided;

(c) Ex officio, with the right to vote, the District Councilors, and

(d) Ex officio, without the right to vote, the Past Presidents.

Section 2.—Representation

As the By-Laws shall provide, each component society shall be entitled to proportionate representation in the House of Delegates but with a minimum of two delegates.

Section 3.—Alternates

Alternates shall be elected, as specified in the By-Laws, in the same manner as delegates are elected. One alternate shall be seated in place of each delegate absent or disqualified for failure to attend meetings or other cause.

Section 4.—Terms of Delegates and Alternates

Delegates and alternates shall serve for two or three years as each component society may determine. One-half or one-third, as the case may be, of the allowed number shall be elected each year.

Section 5.—Quorum

A majority of the authorized number of delegates shall constitute a quorum.

Section 6.—Functions of the House of Delegates

The House of Delegates shall be the legislative body of the Association and shall exercise such other functions as the By-Laws may prescribe.

Section 7.—Issuance and Revocation of Charters

(a) The House of Delegates shall issue charters to medical societies of a county or combination of counties deemed eligible and which have made proper application therefor.

(b) The House of Delegates may suspend or revoke any such charter, after due notice and proper hearing, for cause. "Cause" shall be considered to be any conduct or action, on the part of any component society, deemed in contravention of the Constitution and By-Laws of the Association or the American Medical Association or their "Principles of Medical Ethics." "Cause" shall further be deemed to be any conduct or action of a component society deemed inimical to the best interests of the Association.

(c) It may act on the withdrawal or secession of any component society from the Association and take such measures as are deemed advisable and proper for reinstatement of any component society which may have withdrawn or had its charter suspended or revoked.

(d) A two-thirds affirmative vote of the delegates present and voting shall be necessary for any action under the provisions of this section.

Section 8.—Sessions of the House of Delegates

In each year there shall be one or more sessions of the House of Delegates as fixed in the By-Laws. Special sessions may be called and held as provided in the By-Laws.

Part B.—Council

Section 9.—Composition

The Council shall consist of:

(a) Eleven District Councilors elected from the councilor districts specified in this Constitution; and

(b) Six Councilors-at-Large elected by the House of Delegates, and

(c) The President, President-Elect, and Speaker.

In addition, the Secretary-Treasurer and Editor, ex officio, but without the right to vote.

Section 10.—Councilor Districts

There are eleven districts as follows:

District Number One, comprising San Diego County.

District Number Two, comprising Imperial, Orange, Riverside, San Bernardino, Mono and Inyo counties.

District Number Three, comprising the County of Los Angeles.

District Number Four, comprising the County of Los Angeles.

District Number Five, comprising Ventura, Santa Barbara and San Luis Obispo counties.

District Number Six, comprising Kern, Kings, Tulare, Fresno, Madera, Merced, Mariposa, Stanislaus, San Joaquin, Calaveras and Tuolumne counties.

District Number Seven, comprising Monterey, San Benito, Santa Cruz, Santa Clara and San Mateo counties.

District Number Eight, comprising San Francisco County.

District Number Nine, comprising Alameda County and Contra Costa County.

District Number Ten, comprising Marin, Solano, Napa, Sonoma, Lake, Mendocino, Humboldt and Del Norte counties.

District Number Eleven, comprising Sacramento, Amador, Alpine, Eldorado, Placer, Nevada, Sierra, Yuba, Sutter, Yolo, Colusa, Glenn, Butte, Plumas, Tehama, Trinity, Shasta, Lassen, Modoc and Siskiyou counties.

Section 11.—Election of Councilors

(a) District Councilors shall be elected by vote of the delegates from each district in the manner and at the time specified in the by-laws; provided, however, that at the first meeting of the House of Delegates after a district councilor has been selected, his name shall be submitted to the House by the delegates from the district, and (1) if there is no challenge by any delegate then the speaker shall declare his election completed, and (2) if any delegate shall challenge the election on any ground, including fitness of the nominee of the district to serve as a district councilor, the questions presented by the challenge shall be submitted to a Qualifications Committee consisting of the President, President-Elect and one delegate, appointed by the speaker, from the councilor district involved. The Qualifications Committee shall consider all grounds upon which the nominee is challenged and report back to the House. If the committee reports in favor of confirming the nominee's election, the speaker shall declare him elected. If the committee reports against confirming the nominee's election, a three-fourths affirmative vote shall be necessary to sustain the report of the committee, in which event the nominee

shall be ineligible to serve as the district councilor and the delegates from the district shall immediately proceed to the selection of another nominee for the vacant office. If an adverse report of the Qualifications Committee is not sustained then the nominee shall be declared elected by the speaker.

(b) Councilors-at-Large shall be elected one by one from nominations made on the floor of the House of Delegates. Not more than two councilors-at-large shall be elected from any one councilor district.

Section 12.—Councilors: Terms of Office

Councilors shall serve for terms of three (3) years; one-third to be elected in each year.

Section 13.—Council: Powers and Duties

Subject to the provisions of this Constitution, and all resolutions and enactments of the House of Delegates, the Council shall be vested with full and complete power and authority to manage, control, use, invest, reinvest, lease, make contracts in respect of, and concerning, convey, give, grant, transfer or otherwise dispose of all property and assets of whatever kind or nature owned by the Association, and shall also be vested with full and complete power and authority to do and perform all acts and to transact all business for and on behalf of the Association and to manage and conduct all the work and activities of the Association in carrying out the purposes thereof. The Council shall have such additional duties, powers and functions as are prescribed in the By-Laws.

Section 14.—Election of Councilors on Adoption of this Constitution

Upon the adoption of this Constitution, the delegates from each of the eleven councilor districts shall proceed to elect district councilors as follows: At the annual meeting at which this Constitution is adopted the councilors of the First, Fourth, Seventh and Tenth districts shall be elected for terms of one year each; councilors of the Second, Fifth, Eighth and Eleventh districts shall be elected for terms of two years each; and councilors of the Third, Sixth and Ninth districts shall be elected for terms of three years each. Thereafter, as each term expires the delegates from each district shall elect a district councilor to serve for a term of three years.

Upon the adoption of this Constitution, the councilors-at-large holding office at the time of the adoption shall serve the remainder of their terms of office specified in the previous Constitution and as their terms expire successors shall be elected in the manner and for the terms provided in this Constitution.

Upon the adoption of this Constitution and the election of eleven district councilors the terms of office of the nine district councilors elected prior to the adoption of this Constitution will immediately cease and terminate.

ARTICLE IV.—FUNDS, PROPERTY, DUES, ASSESSMENTS AND EXPENDITURES

Section 1.—Annual Dues

At each regular session the House of Delegates shall, by a majority vote, fix the annual dues to be paid by members of the Association for the ensuing calendar year. Dues payable by active members shall be uniform and equal, except that the House of Delegates may reduce dues for certain groups (by general classification) as the By-Laws may expressly permit.

Dues payable by associate members shall be uniform and equal but may be set at not less than one half the regular dues for active members.

Section 2.—Military Service

During any period at which the United States is at war or requires services of doctors of medicine under an universal military training or draft program, annual dues may be reduced or waived by the House of Delegates with respect to those members serving in the Armed Forces of the United States during the whole or any part of any year.

Section 3.—Leaves of Absence

The Council, on recommendation of a component society, may grant leaves of absence to active members who are seriously ill and cannot practice or who leave practice temporarily for postgraduate study or other purposes acceptable to the component society and the Council and during such leave a uniform reduction of dues shall be established by the Council; provided no leave may exceed one year but shall be subject to renewal.

Section 4.—Special Assessments, etc.

Funds may also be raised by any of the following methods: (a) publications of the Association; (b) voluntary contributions; (c) bequests, legacies, devises, and gifts; (d) special assessments levied by the House of Delegates; and (e) in any other manner approved by the House of Delegates. In the event that the House of Delegates levies any special or other assessment than the annual assessment of dues, it may, in the resolution levying the assessment, fix and determine the time within which such assessment must be paid, the class or classes of members of the Association upon whom it is levied, and the penalty, if any, including forfeiture or suspension of membership in this Association or the component society, or both, to result from nonpayment thereof within the time prescribed.

Section 5.—Annual Budget and Expenditures

At each regular session of the House of Delegates, the Council shall submit to it an itemized budget stating the proposed expenditures of the Association for the ensuing year. The budget may be altered or revised by the House of Delegates, but must be adopted by the House before adjournment of the session. After its adoption, no expenditures in ex-

cess of the amount of the budget item covering the subject of such expenditures may be made in the year covered by the budget by the Association or any of its officers, agents or employees, unless the Council by a three-fourths vote of all voting members shall first approve such excess expenditure by resolution duly adopted. Recurring items in the budget (fixed expenditures covering more than one year) shall, when first adopted, be binding as to subsequent budgets to the extent of commitments or obligations entered into by the Association within authority granted by the House of Delegates or this Constitution or the By-Laws.

Section 6.—Benevolence Fund

At least $1.00 out of the annual dues paid by each active member of the Association shall be allocated to the Physicians' Benevolence Fund and shall only be used for the purposes as set forth in the By-Laws.

Section 7.—All Funds and Moneys to Be Paid to Secretary-Treasurer and Deposited With Depositary

All funds and moneys received for the Association by any officer or agent thereof shall be promptly paid to the Secretary-Treasurer and by him deposited with a depositary selected as such by the Council.

All depositaries selected by the Council shall be banks or trust companies duly licensed to transact business as such in the State of California.

Section 8.—Membership Interest in Association Property

No person other than an active member in good standing shall have any interest in the property of the Association and the interest of any active member therein shall cease when he ceases to be a member of the Association.

If any active member shall resign or otherwise cease to be an active member of the Association, all of his interest in and to all property of the Association shall cease and such cessation of membership shall operate as a release and assignment to the Association of all the right, title and interest of such member in and to all the property of the Association.

ARTICLE V.—REFERENDUM AND PETITION

Section 1.—Referendum and Petition

The right of referendum and petition shall be as set forth in the By-Laws.

ARTICLE VI.—OFFICERS

Section 1.—Officers

The officers of this Association shall be a President, a President-Elect, a Secretary-Treasurer, a Speaker of the House of Delegates, a Vice-Speaker of the House of Delegates and an Editor.

Section 2.—Powers and Duties of the President-Elect

The President-Elect shall act for the President in his absence or disability, and if the office of President becomes vacant the President-Elect shall then succeed to the Presidency to serve as President for such unexpired term and for the term of one year thereafter.

ARTICLE VII.—SCIENTIFIC ASSEMBLY

Section 1.—Objects

The Scientific Assembly of the California Medical Association is the convocation of its members for the presentation and discussion of subjects pertaining to the science and art of medicine.

Section 2.—Sections

The Scientific Assembly shall be divided into sections, each section representing that branch of medicine described in its title.

Section 3.—Creation of New Sections

New sections may be created or existing sections discontinued by the House of Delegates. The Scientific Assembly and its sections shall be conducted in accordance with the provisions of this Constitution and the By-Laws, and such other instructions by the House of Delegates or the Council as may not be in conflict therewith.

ARTICLE VIII.—MISCELLANEOUS

Section 1.—Incorporation

(a) To aid in carrying out the objects of the Association, the House of Delegates at any meeting of any regular or special session thereof may by a two-thirds vote of the members thereof present and acting, authorize, empower and direct the Council to cause the formation and organization of a non-profit corporation under the laws of the State of California, without capital stock, with such incorporators, name, purposes, objects, principal place of business, term, number of directors and directors to serve for the first year and until their successors are elected and have accepted office, and with such provisions regarding the voting power and property rights and interests of the members of the corporation and such further provisions in the Articles of Incorporation thereof, and with By-Laws and composed of such members representing this Association as the Council shall prescribe, fix and determine. The House of Delegates may at its option in connection with the granting and giving of such authority, power and direction to the Council, prescribe, fix and determine any or all of such matters pertaining to the said corporation, its Articles of Incorporation and any provision thereof, By-Laws and membership, and its action thereon shall bind the Council; and the House of Delegates at any meeting of any regular or special session thereof may by a two-thirds vote of the members thereof present and acting, authorize, empower and direct the Council to grant, assign, transfer, convey and deliver, or cause to be granted, assigned, transferred, conveyed and delivered to the said corporation upon the formation thereof without any consideration therefor, any property, real or personal, of the Association, which authorization, power and direction may be given prior or subsequent to the formation and organization of said corporation.

(b) To further aid in carrying out the objects of the Association, the House of Delegates at any meeting at any regular or special session thereof may, by a two-thirds vote of the membership thereof present and acting, authorize, empower and direct the Council to cause the formation and organization of one or more corporations under the laws of the State of California with such incorporators, name, purposes, county where the principal office for the transaction of business is to be located, first directors, the total number of shares, the aggregate par value, if any, of all shares, classes of shares, par value of any shares having par value, statement of the provisions, privileges and restrictions granted or imposed upon the respective classes of shares, or if the corporation be formed without capital stock the authorized number and qualifications of its voting and other rights of each class of members and the liability of each and all classes, to dues or assessments, and with such further provisions in the articles of incorporation thereof and with such by-laws as the Council shall prescribe, fix and determine; and the House of Delegates at any meeting of any regular or special session thereof may, by a vote of two-thirds of the members thereof present and acting, authorize, empower and direct the Council to grant, assign, transfer, convey or deliver or cause to be granted, assigned, transferred, conveyed or delivered to any of such corporations upon the formation thereof or to applicants for health and accident or other insurance in or from any of said corporations at or prior to the formation thereof without any consideration therefor, such funds and property, real or personal, of this Association as the House of Delegates shall from time to time authorize or ratify.

Section 2.—Seal

The Association shall have an Association seal consisting of a circle having on the circumference the words "California Medical Association, Eureka, 1856," with such further emblems, figures and words as the House of Delegates, on recommendation from the Council, shall prescribe.

The power to change the seal shall rest with the House of Delegates.

Section 3.—Amendments

Any member of the House of Delegates at any meeting of any session, other than a special session, thereof may present an amendment or amendments to any article or articles or any section or sections of any article or articles of this Constitution.

Such proposed amendment or amendments shall be in writing and shall be filed with the Secretary and shall thereafter be published at least twice in separate issues of the official journal of this Association prior to the next session of the House of Delegates.

At the said next session, other than a special session, of the House of Delegates, such proposed amendment or amendments shall be submitted to the House of Delegates, for consideration at any meeting of the House of Delegates during that session, and if two-thirds of the Delegates present and voting vote in favor thereof, the same shall be adopted.

Section 4.—Repeal of All Provisions of Existing Constitution

All articles and all sections and all parts of all articles of the existing Constitution are hereby repealed.

* * *

PROPOSED CONSTITUTIONAL AMENDMENTS

Printed herewith for the first time are two proposed amendments to the Constitution which was introduced in the 1950 House of Delegates. These amendments were offered separately from the proposed new Constitution introduced by Reference Committee No. 3. A second printing will be made in a subsequent issue of CALIFORNIA MEDICINE.

Resolved, That Section 4 of Article IV of the constitution of this association, is hereby amended to read as follows:

Section 4, Special assessments, etc.

Funds may be raised by any of the following methods: (a) publications of the association; (b) voluntary contributions, (c) bequests, legacies, devises and gifts, (d) special assessments levied by the house and (e) in any other manner approved by the house. In the event that the house levies any special assessment or other assessment than the annual dues, it may, in the resolution levying the assessment, fix and determine the time within which such assessment may be paid and the class or classes of members upon whom it is levied.

The penalty for failure to pay such assessment shall be levied by the local society.

* * *

Resolved, That Section 9, Part B of Article III of the revised constitution of this association be amended as follows:

"Section 9, Composition.

"The council shall consists of:

"(a) Sixteen district councilors elected from the councilor districts specified in this constitution; and

"(b) Four councilors-at-large elected by the house of delegates, and

"(c) The president, president-elect, and speaker.

"In addition, the secretary-treasurer and editor, ex officio, but without the right to vote."

And that Section 10, Part B of Article III be amended as follows:

"Section 10, Councilor districts.

"(a) The state shall be divided into sixteen councilor districts according to economic and geographic lines. This division is to be effected by the council.

"(b) The state shall be reapportioned at least every five years or oftener if needed by the council.

"(c) The geographical areas of each councilor district and the number of the district shall be as stated in these by-laws."

PROPOSED AMENDMENT TO EXISTING CONSTITUTION

Be It Resolved, That Article VII, Section 1, of the Constitution of the California Medical Association be amended to read as follows:

ARTICLE VII.—COUNCIL AND EXECUTIVE COMMITTEE

Section 1.—The Council

The Council shall consist of the Councilors and ex officio: The President, the President-Elect, and the Speaker of the House of Delegates, each with all the rights of a Councilor.

Subject to the provisions herein, the Secretary-Treasurer and the Editor shall also be ex officio members of the Council, but without the right to vote.

The nine district Councilors shall be elected as follows:

In the interim between the first and second meetings of the House of Delegates at any annual session, the delegates from each Councilor district for which a councilorship is about to become vacant shall meet and elect a Councilor from that district. In the event that a majority of the delegates from any district are unable to agree upon a Councilor, the House of Delegates at its second meeting, shall elect a Councilor from that district. Those councilorships-at-large which are assigned to specified counties by reason of the size of their membership shall in similar manner be elected by the delegates from such specified counties. All nominees for councilorships must be members in good standing.

Unassigned Councilors-at-Large shall be elected by the House of Delegates. Not more than two Councilors-at-Large shall be elected from any one Councilor district; provided, however, that when any one Councilor district shall consist of a component county society having 1,500 or more members, two of the Councilors-at-Large shall be elected from its membership.

Any chapters, sections or paragraphs of the Constitution or By-Laws which are in conflict with this amendment are hereby repealed.

Proposed C. M. A. By-Laws

The following proposed by-laws represent essentially a set of by-laws prepared for submittal to the 1950 House of Delegates in the event the proposed C.M.A. Constitution then before that body were adopted. Inasmuch as the proposed Constitution was not adopted at that time, the original of these By-Laws was not presented to the House of Delegates for official action.

It should be borne in mind that until and unless a new Constitution is adopted by the House of Delegates, new By-Laws in codified form are meaningless. With a new Constitution, if voted, a new set of By-Laws becomes essential. Reference Committee No. 3 considered the original draft of these By-Laws at the time of the 1950 Annual Session. The draft printed here contains several changes from the original form, inserted to make this document completely in key with the proposed Constitution which is now lying on the table of the House of Delegates and which is printed above.

The interim session of the House of Delegates, scheduled for December 2-3, 1950, in Sacramento, will not be in a position to vote on these proposed By-Laws. However, the interim session, acting as a committee of the whole, may discuss this document as a preparatory measure before the 1951 Annual Session, at which time the proposed Constitution will be voted upon.

BY-LAWS

CHAPTER I.—COMPONENT SOCIETIES

Section 1.—Component Society Charters

The charter of each component society shall provide that all the provisions of the Constitution and By-Laws of this Association in force at the time of the issuance of such charter, together with all amendments to either thereof thereafter adopted, in so far as the same are applicable, shall be an integral part of the constitution and by-laws of the component society to which the charter is issued and that the terms and provisions thereof shall control and govern such component society, the officers and members thereof, and that the constitution and by-laws of the component society shall not be amended in any way to conflict or be inconsistent with the Constitution and By-Laws of this Association. Each charter shall be signed by the President and the Secretary-Treasurer of this Association.

Section 2.—Revocation of Component Society Charters

The charter of a component society may be suspended or revoked on any of the grounds specified in the Constitution only in accordance with the following procedure:

(a) *Complaint.* A written complaint, stating the grounds for action, shall be filed with the Secretary-Treasurer by the Chairman of the Council pursuant to resolution adopted by the Council by the affirmative vote of two-thirds of the members thereof.

(b) *Notice.* The Secretary-Treasurer of the Association shall, within thirty days of its receipt by him, send by registered mail to the secretary of the component society concerned, a true copy of such complaint.

(c) *Hearing.* Hearing on such complaint shall be held by the House of Delegates at a meeting of its first session occurring not sooner than three nor more than ten months after the date of its presentation to the Secretary-Treasurer of the Association.

(d) *Decision.* Suspension or revocation of the charter of a component society shall require a two-thirds affirmative vote of the members of the House of Delegates; provided, however, that the delegates of the component society concerned shall not vote, and their number shall not be counted in determining the necessary two-thirds majority.

Section 3.—Component Society Sections

(a) *Geographical or Specialty Sections.* A component society may authorize the formation and existence of branch geographical or specialty sections for scientific investigation and work only, and the members of such geographical sections or specialty sections must be members of such component society.

(b) *Members in Sections to Be Members of Respective Component Societies.* No geographical or specialty section shall be permitted to have any classes of members which classes in whole or in part include non-members of the component society of which any such geographical or specialty section is a branch or subdivision; provided that nothing in this section shall be construed as limiting the guest privileges of such non-members at meetings of such section.

CHAPTER II.—MEMBERSHIP

Section 1.—What Constitutes Membership

The name of a doctor of medicine on the official roster of this Association, after it has been properly reported by the secretary of his component society, and after the dues or other assessments due this Association shall have been paid by the component society for each such member according to the class of membership held by each component society member, shall be prima facie evidence of membership.

Section 2.—Component Society Rosters of Members; Reports

(a) *Roster.* The secretary of each component society shall keep a roster of its members, on which shall be shown the full name, address, school and date of graduation, date of license to practice in this state, class of membership, and such other information as the Secretary-Treasurer of the Association shall prescribe.

(b) *Reports.* The secretary of each component society shall furnish the Secretary-Treasurer of the Association before the first day of March of each year a list of names and addresses of all members in good standing on the first day of January of each year, shall notify in writing the Secretary-Treasurer monthly of all changes in membership of the component society, and shall submit to the Secretary-Treasurer on forms which the Association shall provide, notice of each application for membership in such component county society with the name, address and all other particulars regarding the applicant known to the secretary.

Section 3.—Qualifications of Active, Associate and Affiliate Members

(a) *Component Societies Sole Judges.* Each component society shall, subject to the minimum requirements for eligibility as hereinbelow provided, determine the qualifications for membership for Active, Associate or Affiliate membership therein, and shall be the sole judge of the qualifications of applicants for such membership.

(b) *Qualifications for Active Members.* To be eligible for election to Active membership in a component society, an applicant must hold the degree of Doctor of Medicine issued to him by an institution of learning accredited at the time of the issuance of such degree by the Board of Medical Examiners of the State of California. He must hold an unrevoked license to practice medicine and surgery issued to him by the Board of Medical Examiners of the State of California, which certificate must have been recorded in the office of the County Clerk in the county in which he practices. He must be of good moral and professional character and must not support, nor practice, nor claim to practice, any exclusive or sectarian system of medicine. He must subscribe to the Principles of Medical Ethics of the American Medical Association and to such as may from time to time be adopted by the California Medical Association, and shall recognize the authorized officers of his component society and of this Association as the proper authority to interpret any doubtful points of ethics.

(c) *Qualifications for Associate Members.* To be eligible for election to Associate membership in a component society, an applicant must possess all the qualifications necessary for active membership except that he shall not be engaged in the private practice of medicine and need not hold a license to practice medicine or surgery granted by the Board of Medical Examiners. For the purposes of this section, a Doctor of Medicine engaged in the private practice of medicine is any physician who receives his principal compensation for professional services on a fee basis.

(d) *Qualifications for Affiliate Members.* To be eligible for election to affiliate membership in a component society, an applicant must be, and must continue to be throughout the term of his membership, an intern, resident or house officer in an approved hospital within the county of the component society concerned.

Section 4.—Qualifications and Election of Other Classes of Membership

(a) *Retired Members.* The Council, on recommendation of any component society, may grant retired membership to those active members who have ceased the practice of medicine to the extent and for reasons satisfactory to such component society and the Council, and who shall have been active members of the Association for a total of ten years prior thereto. Retired membership shall endure as long as the retired member does not engage in full time practice of medicine; but in the event that a member classified as retired resumes active, full time practice of medicine such resumption shall automatically terminate retired membership and reestablish active membership. Upon resumption of full time practice by any retired member, the secretary of his component society shall transfer such member from the retired classification to the active classification, and notify the Secretary of this Association, who shall do likewise with respect to the membership rolls of this Association.

(b) *Honorary Members.* The House of Delegates on recommendation by the Council may elect as honorary members any persons distinguished for their services or attainments as doctors of medicine or in the field of public health, or for research or other scientific work contributing to medicine.

(c) *Life Members.* Those life members elected prior to the adoption of these By-Laws shall remain as such with all of the rights and privileges pertaining to such membership contained in the prior By-Laws, but no new life members shall be elected after the date of the annual session of the House of Delegates at which this section is adopted.

(d) *Special Memberships.* The House of Delegates may, from time to time, establish special and limited classes of membership in this Association for undergraduate medical students, or for interns, house officers, or residents wherever a component society makes no provision for this class of membership. The House of Delegates may also, from time to time, establish other special and limited classes of membership and fix the dues, qualifications, duration and privileges of such membership.

Section 5.—Rights and Privileges of Membership

(a) *Active Members.* Subject to the provisions of the Constitution and these By-Laws, all active members shall be equally privileged to vote, to hold office and to enjoy all other rights and privileges of the Association.

(b) *Associate Members.* Subject to the provisions of the Constitution and these By-Laws, associate members shall have all the rights and privileges of Active Members except the right to vote or to hold office.

(c) *Affiliate, Honorary and Retired Members.* Members in these classes shall be privileged to receive publications of the Association at such rates as the Council may from time to time determine; they shall not have the right to vote nor to hold office.

Section 6.—Membership Where No Component Society Exists

Any Doctor of Medicine residing in an area in which there is no component society may apply for membership in the component society most convenient to the area in which he practices medicine, and if otherwise qualified he may be elected to membership therein.

Section 7.—Membership Where Major Office and Residence Are In Different Component Society Areas

A Doctor of Medicine may apply for membership only to that component society whose charter covers the area in which his major office for professional practice is located; provided that a Doctor of Medicine who resides in one county and practices in another may apply for membership to the component society whose charter covers the area in which his residence is located, if both such component society and the component society of the area in which his major office is located approve.

Section 8.—Membership as Affected by Transfer of Location of Office

A member who changes his office from the county through whose component county society he holds membership in this Association, to another county in which there is a component society, is eligible to membership in the component society of his new location on the presentation of a transfer card, and satisfactory evidence that his dues have been paid in full in the component society in which he holds membership; provided, however, that no evidence which would disqualify him for membership exists.

He shall forfeit his membership in this Association one year after such change of location of practice unless after proper application he is elected to membership in the society of the county to which he has moved.

Section 9.—Transfer Cards

When a member in good standing in a component society moves to another county or other jurisdiction in this state he shall, on request, be given a transfer card, without cost. He must assume such financial obligations as shall be deemed proper by the component society to which he is transferred, and to which he makes application for membership by transfer.

Section 10.—Termination of Membership

(a) *By Expulsion from Component Societies.* Expulsion from any component society, after due proceedings in accordance with these By-Laws, upon becoming final terminates all the rights and privileges in this Association of the member so expelled.

(b) *By Failure to Pay Dues.* If the annual assessments of dues, payable to this Association or to the American Medical Association by any member of this Association, are not paid in full on or before April 1 of any year, such member shall automatically lose his membership in this Association as of April 1 of such year. The Council of this Association, in its discretion, upon payment of such unpaid dues, and any other assessments or dues accruing thereafter, may at any time reinstate such member.

(c) *By Revocation of Physician and Surgeon's Certificate.* Any member whose license to practice medicine and surgery in the State of California is revoked shall, upon receipt of written evidence of such revocation by the Secretary of this Association, thereupon cease to be a member of this Association.

(d) *Acts and Conduct Subjecting Member to Censure, Suspension or Expulsion by Component Society.* Any member of a component society who has been adjudged guilty of a criminal offense involving moral turpitude, or who has been duly adjudged guilty by his component society, in accordance with the procedural requirements of these By-Laws, of gross misconduct as a physician or a surgeon or of a violation of any of the provisions of the constitution or by-laws or principles of professional conduct of his society or of the Principles of Medical Ethics promulgated from time to time by this Association or by the American Medical Asso-

ciation, shall be subject to censure, suspension or expulsion from his society by such component society.

CHAPTER III.—DISCIPLINARY PROCEDURE

Section 1.—Disciplinary Procedure for Component Societies

The procedure to be followed by each component society with respect to the censure, suspension or expulsion of a member shall be:

(1) *Charges; Formal Requirements; a Formal Charge Must First Be Made.* Such charge must be in writing, signed by the accuser, and if made by a person other than a member of the society must be sworn to before an officer of the State of California authorized to administer oaths. Charges must state the acts or conduct complained of with reasonable particularity.

(2) *Charges; Filing; Secretary's Duties; Presentation to Board of Directors (or Grievance Committee).* Charges must be filed with the secretary of the accused member's component society. At the first regular or special meeting of the Board of Directors (or other governing body, whether called Council, Board of Trustees, Executive Committee, or any other name, all of which are herein included in the term "Board of Directors") of such component society held after charges are filed, the secretary must present said charges to the Board. The Board of Directors shall then or at any adjournment of said meeting, but not more than thirty days after the date of such regular or special meeting, consider the charges, and in its discretion determine whether or not further proceedings shall be conducted. If the Board determines that no further action shall be taken, the charges shall be dismissed.

If a component society has no board of directors and more than ten members, its members must, at a regular meeting of the society, elect a grievance committee of not less than five (5) active members in good standing; two members shall be designated by the society to serve for a period of one year, two members shall be designated to serve for a period of two years, and one member shall be designated to serve for a period of three years. At the expiration of the terms of office of the respective members of such committee, successors shall be elected in like manner to serve for a period of three years each. Such grievance committee shall exercise all the power and perform all the duties herein conferred upon boards of directors in the manner and within the times herein provided. If a society has less than eleven members, the entire society, exclusive of the accuser and accused, shall constitute the grievance committee. All references herein to board of directors shall be deemed to include such grievance committees, and component societies of ten members or less.

(3) *Service of Charge Upon Accused.* If the Board of Directors determines that further action, with respect to said charges, shall be taken, the Board must, within fifteen (15) days after such decision, cause a copy of the charges to be served upon the accused by personally delivering a copy thereof to him, or by depositing a copy thereof in the United States mail, registered and addressed to the accused either at his last known office or at his last known residence.

(4) *Time and Place for Hearing; Service of Notice Thereof.* The Board of Directors shall, at said meeting at which its decision to proceed is made, fix a time and place for a hearing of said charges. Written notice of the time and place set for the hearing shall be served upon the accused within fifteen (15) days by personal delivery or registered mail as aforesaid.

The time so set for a hearing shall be not less than fifteen (15) days after the accused has been served as aforesaid, with a copy of the charges and with the notice of the time and place set for the hearing; said hearing must be held within the county in which the accused holds his county society membership. The hearing before the Board of Directors must actually commence within six months from the date of the filing of written charges. Failure to comply with this requirement shall constitute an automatic dismissal of the charges.

(5) *Right of Accused to Answer; Time to Answer; Formal Requirements.* The accused may, not less than five (5) days before the time set for a hearing, answer said charges. The answer shall be in writing and the original and three copies shall be filed with the secretary of the society; provided, however, that the failure of the accused to answer shall not be deemed to be an admission of the truth of the charges or a waiver of the accused's right to a hearing with respect to said charges.

(6) *Rules Governing Hearing; Duties of Referee of Society; Advice as to Procedure Only.* The Board of Directors shall give ample opportunity both to the accuser and the accused to be heard in person, and to present all testimony, evidence, or proofs which the accuser or the accused may deem necessary, provided that the Board may reject all testimony, evidence, or proofs, which in the judgment of the Board are immaterial, irrelevant or unnecessarily repetitious.

Either the Council or the Executive Committee of the California Medical Association, whenever it shall come to the attention of either thereof that a disciplinary proceeding is pending before any component society, may of its own motion, and shall, upon the request of such component society or of the member or members thereof the subject of any such disciplinary proceeding, appoint a referee who may, but need not be, a member of the California Medical Association, and shall cause the Secretary of the California Medical Association to notify the secretary of such component society of such appointment. The referee so appointed shall preside at the hearing of said charges and shall make all decisions concerning the admission or rejection of testimony or other evidence and procedure. The referee shall not, however, have any voice nor participate in any manner in the determination by the Board of Directors of the disposition of the charges. During the hearing the referee shall perform all duties normally per-

formed by the presiding officer of the Board of Directors.

(7) *Record of Proceedings; Shorthand Reporter; Duty of Secretary to Preserve Board Records; Right of Accused to Copy.* The secretary shall preserve the original of said charges with a certificate of personal delivery or of mailing of a copy or copies thereof, as the case may be, the original notice of the time and place set for the hearing with a certificate of personal delivery or of mailing of a copy or copies thereof, as the case may be, and the original of the answer filed by any member accused if an answer be filed. At the hearing, the Board of Directors shall, at the expense of the society, employ a competent shorthand reporter to record and transcribe into typewriting testimony adduced on behalf of the accuser and the accused and all rulings made. The original charges with certificate of service thereof, the original notice of time and place for hearing with certificate of service thereof, the answer or answers, if any be filed, all documentary evidence introduced at the hearing, the typewritten transcript of the testimony and the written decision of the Board of Directors shall constitute the record of the entire proceedings. The Secretary shall, upon receipt from accused of a sum sufficient to defray the cost thereof, cause a copy or copies of such record to be transcribed, certified and furnished to the accused.

(8) *Decision of Board; When Must Be Written; Rules Governing Vote of Board.* The Board of Directors, after having given the accuser and the accused member full opportunity to be heard, shall conclude the hearing and shall render its decision in writing not more than thirty (30) days thereafter. Hearing shall include any oral arguments and the filing and consideration of any written briefs. The Board of Directors by a two-thirds affirmative vote of all the eligible members of the Board present and voting may exonerate or may censure, suspend or expel the accused member as the facts in its opinion may justify.

The decision of the Board of Directors may be expressed in resolution adopted by said vote. The decision may, but need not, contain an opinion and need only be signed by the secretary or the acting secretary of the component society.

The failure of at least two-thirds of all the members of the Board of Directors present and voting to agree upon the disposition of the charges shall act automatically as a dismissal of the same. No member of the Board of Directors not present at the said hearings for the entire time thereof shall be entitled to vote with respect to the disposition of the charges.

(9) *Suspension; Maximum Period; Status of Suspended Member.* If the Board of Directors shall determine to suspend an accused member, the term of such suspension shall be within the discretion of the Board, provided that in no case shall a member be suspended for a period greater than one year. A suspended member shall have no rights or privileges in the society, provided that at the expiration of the period of suspension such suspended member shall not be reinstated to membership in good standing until he applies for reinstatement and pays all dues accrued during said period of suspension.

(10) *(a) Board's Decision; Secretary to Send Copies.* Within ten (10) days after the decision of the Board of Directors, the secretary of the society shall transmit a copy of the decision to the Board, to the accused member or members and to the Secretary of this Association.

(b) Board's Decision Final; Subject to Appeal. The action of the Board of Directors of a component society shall be final, subject only to appeal to the Council of the California Medical Association in such cases as are provided in these By-Laws.

The decision of the Board of Directors shall not become effective until the expiration of ten days after time during which an appeal may be taken to the Council of this Association. Filing an appeal with the Secretary of this Association shall automatically stay the execution of the decision of the Board of Directors of the component society until written notice of the action of the Council of this Association with respect to appeal has been received by the secretary of the component society from which the appeal was taken.

(c) Technical Rules of Evidence Not to Govern Disciplinary Hearings. All hearings with respect to the disposition of charges against a member of a component society shall be held and conducted in such manner as to ascertain all the facts fairly to the accuser and accused, eliminating all formal or technical rules and requirements which ordinarily pertain to judicial proceedings.

(d) Members Agree That No Cause of Action Shall Accrue. Any person so charged, censured, suspended, or expelled shall have no claim or cause of action against this Association, a component society or any member, director, councilor or officer, thereof by reason of such charges, or the hearing or the consideration thereof or censure, suspension or expulsion therefor.

(e) Expelled Members; Right to Apply for Membership; When Accrues. Any person whose membership has been involuntarily terminated in a component society by reason of violation of these By-Laws may apply for membership after the expiration of one year from the date said membership was terminated, and such application shall be considered in the same manner as a new application for membership.

Section 2.—Procedure for Appeal to Council

A member of a component society censured, suspended or expelled by his county society may appeal from the action of such component society to the Council of this Association within the period of two months succeeding the date of such censure, suspension, or expulsion. Appeals shall be in writing and be filed within the said period of two months in the office of the Secretary of this Association. Said appeal shall be accompanied by a copy of the record of the entire proceedings before the component society duly certified by its secretary, provided the Chairman

of the Council may, in his discretion, extend the time of the appellant to file said record. Upon the filing of an appeal the secretary shall present it to the first subsequent meeting of the Executive Committee or the Council. Appeals shall be heard by the Council only after reasonable notice of not less than ten (10) days in writing of the time and place of the hearing of the appeal has been given to the appellant member and the president and secretary of the component society as provided in Section 4 hereof.

Section 3.—Rules Governing Appeals

In hearing appeals, the Council shall review all questions of procedure, and may, in its discretion, review the evidence contained in the record of the original proceedings held before the Board of Directors of the component society. The Council may make findings of fact contrary to, or in addition to, those made by said Board of Directors. Such findings may be based on the evidence adduced before said Board of Directors, either with or without the taking of evidence by the Council. The Council shall use any lawful means which in its judgment will best and most fairly present all the facts involved. The Council may, for the purpose of making such findings or for other purpose in the interest of justice, take additional evidence of or concerning facts material to the questions involved, or may, for such purpose, appoint a committee of its members or any notary public to act as referees or referee for the taking of such additional evidence.

Such referee or referees shall render a report in writing to the Council, which report shall contain a clear statement of the facts found by the referee or referees from the testimony or evidence adduced.

The Council may affirm, reverse or modify the decision of the Board of Directors or make such other disposition of the proceedings as it may deem proper.

In every case of an appeal the individual councilors and the Council, through a committee thereof, prior to any hearing being held upon the appeal, shall exert all proper efforts at conciliation and compromise.

This Association may be represented by its attorney to advise the Council upon procedural questions only.

The decision of the Council shall be final and bind the appellant member and the component society.

CHAPTER IV.—SESSIONS AND MEETINGS; SCIENTIFIC SECTIONS

Section 1.—Division of Scientific Work

(a) *Scientific Sections.* The scientific work of the Association shall be divided into fifteen scientific sections, as follows: General Medicine; General Surgery; Pediatrics; Eye, Ear, Nose and Throat; Urology; Anesthesiology; Obstetrics and Gynecology; Radiology; Industrial Medicine and Surgery; Pathology and Bacteriology; Dermatology and Syphilology; Neuropsychiatry; General Practice; Public Health; and Allergy.

(b) *Rules of Procedure of Scientific Sections.* Each scientific section shall adopt rules of procedure for its own better government and work. Its officers shall be responsible for the proper keeping of records of scientific and business meetings.

(c) *Officers of Sections.* The members of each section shall at the regular annual session of the Association elect a chairman and a secretary to serve for the term of one year.

(d) *Program.* Each of the sections shall present a scientific program at the annual session of the Association, and its officers shall be responsible for the proper preparation of the same, and for the proper cooperation with other scientific sections during the annual meeting.

Section 2.—Registration at Annual Sessions Necessary for Participation Therein

Each member in attendance at any session shall register, after his right to membership has been verified by reference to the records of this Association. No member shall take part in any of the proceedings of any session until he has complied with the provisions of this section of the By-Laws.

Section 3.—Addresses and Papers at Annual Session

(a) The program at Annual Sessions shall be divided between general meetings and section meetings as the Council shall deem appropriate.

(b) At the General Meetings shall be delivered the annual address of the President and, with the sanction of the Council, such other addresses and reports as may be deemed desirable.

(c) Excepting the President's address and such other addresses and reports as the Council may determine, no address or paper shall occupy more than twenty minutes in delivery.

(d) No member, except by unanimous consent, shall speak more than once in the discussion of any paper nor longer than five minutes at any one time. This subsection of the By-Laws shall be printed on all programs of general and section meetings.

Section 4.—Scientific Papers Property of Association

All papers read before this Association shall be its property.

Each paper, when it has been read, shall be deposited with the secretary of the section, by him to be promptly turned over to the Secretary of the Association.

Section 5.—Scientific Papers Not to Be Published Elsewhere

Authors of papers read before this Association shall not cause them to be published elsewhere except with the consent of the Committee on Publications.

Section 6.—Committee on Arrangements for Annual Session

(a) *Appointment and Duties.* The Chairman of the Council, subject to the approval of the Council, shall, at least six months before each annual session,

appoint a Committee on Arrangements for the sessions of the ensuing year, one member thereof being designated as the general chairman. This committee shall consist of five members.

The Secretary-Treasurer of the Association shall be ex officio a member of this committee.

This committee shall have charge of all local arrangements not otherwise provided for.

The terms of office of members of this committee shall expire when the succeeding committee on arrangements is appointed.

As the local Committee on Arrangements this committee shall provide suitable meeting places and shall have general charge of all local arrangements. The committee shall have power to appoint local advisory members and subcommittees to aid in its work.

(b) *Commercial Exhibits.* The Council shall decide what portion of the income from commercial exhibits or other convention services shall go to the local Committee on Arrangements. The location and rules for the commercial exhibits and other accessory annual session activities shall be subject to the approval of the Council.

(c) *Local Convention Expenses.* The Council shall decide what portion of the local expenses shall be borne by the Association.

(d) *Report on Committee on Arrangements.* The Committee on Arrangements shall make and file with the Secretary-Treasurer of the Association an itemized, detailed report of all its receipts and disbursements, and shall remit any moneys due the Association remaining in its possession, to the Secretary-Treasurer.

Section 7.—All Meetings of Same Session Shall Be in Same Locality

The general meetings of the Association, the meetings of the House of Delegates, and the meetings of the Scientific Assembly and its sections at any session shall be held in the State of California at the same locality and in buildings as convenient of access, one to the other, as may be possible.

CHAPTER V.—HOUSE OF DELEGATES

Section 1.—Secretaries of Component Societies To Furnish Lists of Delegates and Alternates: Election and Lists

Each component society shall elect a delegate and one alternate for such delegate in an aggregate number of delegates and alternates equal to the total number of delegates and alternates to which the component society is entitled. At least sixty days prior to the next scheduled session, the secretary of each component society shall forward to the Secretary-Treasurer of the Association, on forms provided by the Association, the names and addresses of each delegate and his alternate elected by such component society, and shall certify thereon the dates of election and expiration of terms of service of each delegate and his alternate.

Failure to conform to this provision shall constitute grounds for disqualification of the delegation in default for the scheduled session, at the discretion of the House of Delegates.

Section 2.—Representation

Commencing with the 1952 regular session of the House of Delegates, each component society shall be entitled to two delegates with one additional delegate for each one hundred active members, or fraction thereof, over and above its first one hundred active members, as of the first day of the preceding November.

Section 3.—Limitations on Seating of Delegates

Only duly elected delegates or their elected alternates may be seated at any session of the House of Delegates unless the Secretary of the Association has been given due notice of substitution at least fifteen (15) days in advance of the session.

Section 4.—Disqualification of Delegates or Alternates for Absence From a Session

Any delegate absent without good cause from two or more consecutive meetings of the House of Delegates, and who has failed to give fifteen days' notice to the Secretary of the Association of his inability to be present, shall thereupon be disqualified as a delegate and, in addition, ineligible for reelection as a delegate or alternate for three years immediately succeeding the expiration of his term; except that the Committee on Credentials may excuse absence on presentation of good cause therefor.

Section 5.—Notification of Delegates

The secretary of each component society promptly shall notify in writing each delegate and alternate immediately after his election to such office, and shall expressly direct each delegate's and alternate's attention to the provisions of Section 4 above.

Section 6.—Qualifications of Delegates and Alternates

At least three (3) years' active membership in good standing in the component society immediately preceding election shall be required for election as delegate or alternate.

Section 7.—Sessions and Meetings

(a) In each year there shall be two regular sessions of the House of Delegates; the time and place of such sessions to be determined by the Council as far as possible in advance and notice thereof published in the Journal of the Association. One of these sessions shall be held in the first six months of each calendar year and is designated the Annual Session; the other shall be held in the last six months of each calendar year and is designated the Interim Session.

(b) In addition to regular sessions, special meetings of the House of Delegates may be called at any regular or special meeting of the Council, by a two-thirds vote of all the members of the Council, or by written call stating the object of the meeting, filed with the Secretary in the office of the Association and signed by one-half or more of the members of the House of Delegates. Upon the filing of such call

with the Secretary, the Council shall within thirty (30) days thereafter fix the time and place for the holding of such special meeting and cause written notice thereof stating the object of the meeting to be sent by United States mail, postage fully prepaid, to each member of the House of Delegates, addressed to him at his office or place of residence, as shown by the records of the Secretary's office, at least fifteen (15) days prior to the date of the meeting.

(c) Resolutions and other new business may be introduced at either regular session, but shall not be acted upon until the next regular session; provided, however, that any resolution designated as an emergency measure may be acted upon at the session in which it is introduced, but shall require a two-thirds affirmative vote for adoption.

Section 8.—House of Delegates Committees

Prior to or at the commencement of each annual session the Speaker of the House shall appoint from the members thereof the following committees:

1. A Committee on Credentials,
2. A Reference Committee on Finance, to review the reports of the Secretary-Treasurer and Executive Secretary and to study and make recommendations to the House of Delegates on the budget submitted by the Council and the amount of dues for the ensuing year.
3. A Reference Committee on the reports of Officers, Council, Standing and Special Committees, and
4. Two or more Reference Committees on resolutions, amendments to the Constitution and By-Laws, and new and miscellaneous business (the Speaker may allocate amongst these committees all business properly referable to them).

Section 9.—Membership of Credentials and Reference Committee

Each of the aforesaid committees shall consist of three members, the chairman of each to be designated by the Speaker.

The Speaker, the House concurring, shall refer said reports, resolutions, and business to the respective Reference Committees, but may allocate among them any of said reports, resolutions or portions thereof, and other business, to avoid duplication and to expedite the business of the House of Delegates.

Each Reference Committee shall prepare a written report dealing with and making recommendations on all matters submitted to it. In those instances in which resolutions or other matters remain before a Reference Committee between meetings of the House of Delegates, copies of such resolutions or other matters and the recommendations of the committee thereon shall be mailed or delivered by the Secretary to each elected delegate and alternate at least thirty days (or if less than thirty days intervenes between meetings, as early as possible) prior to the meeting of the House of Delegates at which such resolutions or other matters and recommendations concerning them are to be considered. The report of each committee may be acted upon as a whole or section by section, as the House may determine.

Section 10.—Duties of Credentials Committee

The Secretary of the Association shall supply the Committee on Credentials with the necessary information concerning the membership of the House of Delegates.

The Secretary shall give this committee a list of component societies, showing the total membership as of November 1 of the preceding year. This committee shall ask each delegate and alternate to present his written credentials, but shall accept the official written list submitted by the secretary of any component society; provided that such written list be sent to the Secretary of the Association at least fifteen days before the beginning of the annual session.

The Committee shall make a written report to the House of Delegates of the delegates and alternates entitled to membership therein.

Section 11.—Special Committees of House of Delegates

The Speaker, the House of Delegates concurring, shall have the right to appoint special committees of the House for special work. All committees of the House of Delegates shall present their reports to the House of Delegates in writing.

CHAPTER VI.—COUNCIL

Section 1.—Council: Organization

At the first meeting of the Council held after the adjournment of the last meeting of the House of Delegates at the annual session of the Association, the Council shall organize by the election of one of the Councilors as Chairman of the Council, who shall serve as such up to the first Council meeting held after the adjournment of the last meeting of the House of Delegates of the next succeeding annual session of the Association; and a Vice-Chairman who shall hold office for the same term, and who, in the absence of the Chairman, shall perform the duties of the Chairman. The Secretary-Treasurer of the Association shall serve as the Secretary of the Council.

Section 2.—Registry

The Secretary-Treasurer, in writing, shall request each Councilor to register his address where he desires all notices to be sent to him by mail or telegram.

Section 3.—Order of Business

At meetings of the Council, business shall be transacted as the Council may determine from time to time by resolution.

The Council shall provide and fix the order of business of the House of Delegates at each session, provided that the House of Delegates may change the order of business by a majority vote.

Section 4.—Executive Committee of Council

The Executive Committee shall consist of the President, President-Elect, Chairman of the Council,

Chairman of the Auditing Committee, and one other member of the Council (elected by the Council at its organization meeting each year). The Secretary-Treasurer and Editor shall be members ex officio, but without the right to vote. The organization, duties and powers of the Executive Committee shall be as provided in the By-Laws.

Section 5.—Auditing Committee of Council

The Chairman of the Council, subject to its approval, shall appoint an auditing committee of three members, designating one of the members as its chairman.

The Auditing Committee shall inspect all bills and claims against the Association, and no bill or claim shall be paid except upon voucher or draft having the approval of at least two of the three members of the Auditing Committee; provided, however, that any bill or claim may be paid without the approval of any member of the Auditing Committee by a majority vote or written approval of a majority of all the members of the Executive Committee.

Section 6.—Duties of District Councilors

Each District Councilor shall be organizer, peacemaker and censor for his district. He shall visit each county in his district at least once a year for the purpose of organizing component societies where none exist, of inquiring into the condition of the profession, and of maintaining touch with the activities of the component societies of his district. He shall in writing make an annual report of this work and of the condition of the profession of each county in his district to the Council, which shall take such action thereon as it may deem best.

Section 7.—Expenses of Councilors and Officers

Councilors and officers shall be allowed railroad fare or mileage not exceeding 5 cents a mile, plus an allowance for maintenance expense of ten dollars a day, while absent from their places of residence; (a) in attending Association, district or county society meetings; (b) meetings of committees of the Association; (c) authorized councilor or officer visits to county societies; (d) and otherwise when on official business, authorized or approved by the Council.

Section 8.—Mail Ballot

The Chairman of the Council, at any time, may direct the Secretary to submit any urgent matter or question to the members of the Council by mail ballot, the question or proposition being prepared through conference of the Secretary with Chairman of the Council and the Chairman of the Executive Committee; and the vote of two-thirds of the members upon such question by mail or telegraph shall be binding upon the Council.

Section 9.—Offices

The Council shall provide and secure such offices for the Association as may be required to conduct its activities and business properly.

Section 10. — Employment of Secretary-Treasurer, Assistant Secretaries, Editor and Associate Editors

The Council shall employ a Secretary-Treasurer and an Editor, and, in its discretion, one or more Assistant Secretaries or Associate Editors. The terms of their employment shall be such as are satisfactory to the Council, provided, however, that no contract of employment shall, by its terms, exceed a period of three (3) years from the date of the organization meeting at which such contract is authorized.

Section 11.—Qualifications of Secretary-Treasurer and Editor

No person shall be eligible to the office of Secretary-Treasurer or Editor or Associate Editor who does not hold the degree of Doctor of Medicine, but membership in this Association shall not be a necessary qualification for the offices of Secretary-Treasurer, Editor or Associate Editor.

Section 12.—Executive or Field Secretaries or Representatives

The Council may employ one or more Executive or Field Secretaries or representatives, who need not be physicians or members of the Association. The duties of such a representative or representatives, if appointed, shall be determined by the Council by resolution.

Section 13.—Legal Counsel

The Council at its annual organization meeting shall appoint one or more legal advisers, giving each such title as may be deemed proper. It shall fix the amount of retainer and other fees.

The Council shall have the right to request the attendance of Counsel of the Association at any meetings at which it might desire his presence and advice, and at such meetings he shall call attention to matters in which the legal aspects may be of importance, and shall give such other opinions in special matters as may be requested of him by the Council.

The General Counsel shall present in writing as promptly as the same may be properly prepared, such legal opinions as may be requested by the House of Delegates, the Council or the Executive Committee.

CHAPTER VII.—COMMITTEES

Section 1.—Standing Committees

The standing committees of this Association shall be as follows:

(a) Scientific Work
(b) Public Policy and Legislation
(c) Medical Defense
(d) Medical Education and Medical Institutions
(e) Hospitals, Dispensaries, and Clinics
(f) Medical Economics
(g) Associated Societies and Technical Groups
(h) History and Obituaries
(i) Industrial Practice
(j) Postgraduate Activities

(k) Public Relations
(l) Physicians' Benevolence Committee
(m) The Reference Committees of the House of Delegates

until final adjournment of each regular session.

Section 2.—Standing Committees; How Elected; Term of Office

Unless otherwise provided in these By-Laws, each of the standing committees (except House of Delegates Reference Committees) shall consist of one member of the Council and two other members. Members of standing committees (other than House of Delegates Reference Committees) shall serve for a term of three (3) years. One member of each of these committees shall be nominated annually by the Council and if approved by the House of Delegates shall be deemed elected.

Section 3.—Report Procedure for All Committees

Regular standing and special committees of the Association may make investigations and surveys on authorization of the Council or House of Delegates, but all recommendations and reports of all committees (unless expressly otherwise provided in the Constitution or By-Laws) must be submitted only to the Council or House of Delegates. Other than as herein stated no committee is authorized to act for or represent this Association.

Section 4.—Advisory Groups to Standing Committees

To aid it in its work, each committee, if it so desires, shall have the power to appoint an Advisory Group to its committee, consisting of from two to ten members. Such advisory members, if present at a regular committee meeting, shall not have the right to vote.

Section 5.—Officers of Standing Committees

The chairman of each of these committees, except the Committee on Public Relations, shall be nominated and elected annually by the Council, by and with the approval of the House of Delegates. The chairman of the Committee on Public Relations shall be elected by said committee, subject to the approval and confirmation of the Council, and in the event of a failure to elect within sixty days after adjournment of the annual session the Council shall elect said chairman. Each of these committees shall, each year, except as otherwise provided in these By-Laws, at its first meeting or official consultation, during or following the annual session elect its own secretary.

Section 6.—Secretary-Treasurer's Notice to Standing Committees

The Secretary-Treasurer of the Association, within one month after the annual session, shall write the Committee Chairman of the preceding year, to call a meeting for organization and consideration of any business. The Secretary shall also send a copy of this letter to each of the other members of the committee.

Section 7.—Annual Reports of Standing Committees

At least sixty days prior to the annual session, each of these committees shall submit a written report to the Council on its work during the preceding year, the same to be printed in the Pre-Convention Bulletin as otherwise provided.

Section 8.—Committee on Scientific Work

The Committee on Scientific Work shall consist of the Secretary-Treasurer, the secretaries of the sections on general surgery and general medicine and three other members to be elected by the Council, each of these three members to serve three years, one member being elected each year. The Secretary-Treasurer shall be chairman.

This committee shall determine the character and scope of the scientific proceedings of the Association for each session, and shall invite the guest speakers, subject to the instructions of the Council.

At least thirty days previous to each annual session it shall prepare and issue a program announcing the order in which papers and discussions shall be presented.

This committee shall have one joint session with the section secretaries, at a time and place to be designated by the chairman of the committee, at least forty-five days prior to the annual session, to coordinate more efficiently the various activities of the Association at its annual session. The chairman of the local committee on arrangements shall be invited to attend this meeting.

Section 9.—Committee on Public Policy and Legislation

The Committee on Public Policy and Legislation shall consist of three elected members, and ex officio, the President and President-Elect.

The chairman of the committee, and in his absence, the President, shall act as chairman at the joint meetings of this central state group and of auxiliary county groups.

(a) *Functions of the Committee.* The Committee on Public Policy and Legislation and its auxiliary county groups shall represent the Association in securing and enforcing legislation in the interest of public health and of scientific medicine, subject, however, to the approval of the Council.

(b) *County Auxiliary Committees on Public Policy and Legislation.* Each component society shall appoint or elect three of its members as members of its auxiliary Committee on Public Policy and Legislation, designating one member as chairman; and the component society secretary shall send promptly the names and addresses to the Secretary of this Association.

(c) *Work of Auxiliary County Committees.* The Committee on Public Policy and Legislation of this Association, with the sanction of the Council, shall formulate the duties of these county auxiliary committees and supply each member with a copy of its suggestions and instructions. The auxiliary committeemen shall be accountable to their component societies and to the Council of this Association for

prompt and continued cooperation with the Committee on Public Policy and Legislation of this Association.

Section 10.—Committee on Medical Defense

The Committee on Medical Defense, subject to the approval of the Council, shall prepare plans and establish rules for the protection of the legal rights of members of this Association against whom suits for alleged negligence have been threatened or brought.

It may assist in the defense of any member sued for alleged negligence if the member was in good standing and had complied with the rules of the Council when the service on account of which suit was threatened or brought was rendered—provided that the committee determines that the position of the member merits such action.

Section 11.—Committee on Medical Education and Medical Institutions

The Committee on Medical Education and Medical Institutions shall serve in this State for the Council on Medical Education of the American Medical Association.

It shall keep in touch with the problems pertaining to medical education and to medical and other institutions of training for medicine and the healing art.

Section 12.—Committee on Hospitals, Dispensaries and Clinics

The Committee on Hospitals, Dispensaries and Clinics shall serve in this State for the Council on Hospitals of the American Medical Association.

It shall keep in touch with the problems arising in the fields of work of all types of hospitals, dispensaries and clinics giving special attention to those activities that are, or tend to become, a menace to the best interests of scientific medicine and of the profession and its members.

Section 13.—Committee on Medical Economics

The Committee on Medical Economics shall investigate matters affecting the economic status of doctors of medicine.

Section 14.—Committee on Associated Societies and Technical Groups

The Committee on Associated Societies and Technical Groups, subject to the instructions of the Council, shall endeavor to create proper liaisons between this Association and other state and national medical organizations, as well as with the organizations of related professions, such as dentistry, pharmacy and nursing. It shall also endeavor to bring about a proper understanding with non-medical organizations or groups of technicians and others whose work has a bearing on or is related to the practice of medicine.

Section 15.—Committee on History and Obituaries

The Committee on History and Obituaries shall compile and prepare for the archives and for the publications of the society suitable articles on the history of the Association and statements concerning deceased members. The Editor and the Secretary shall be members of this committee, ex officio.

Section 16.—Committee on Industrial Practice

The Committee on Industrial Practice shall keep in touch with matters and problems peculiarly connected with industrial practice.

Section 17.—Committee on Postgraduate Activities

The Committee on Postgraduate Activities, of which the Secretary-Treasurer shall be an ex officio member, shall use its best efforts to promote the postgraduate and clinical courses and instruction among the component county units of the Association.

The supervision of such postgraduate and clinical courses and instruction shall be carried on through the central offices of the Association, the Council being empowered to defray travel expenses of guest speakers and other costs incident to such work to such amount as in the judgment of the Council may be deemed proper. In the development of such postgraduate and clinical courses and instruction, it is stipulated that the component societies, through their constituted representatives, shall cooperate with the Standing Committee on Postgraduate Activities and shall also arrange to bear a proper proportion of the expense thereof of such amount as may be mutually agreed upon.

Section 18.—Committee on Public Relations

The Committee on Public Relations shall consist of the chairmen of the following committees: Public Policy and Legislation, Medical Economics, Associated Societies and Technical Groups, the President, President-Elect, and two additional members appointed by the Council.

The committee shall be responsible to the Council and the House of Delegates for all of its activities.

The Council or the Executive Committee may instruct the Committee on Public Relations, and outline to it certain policies and duties which shall be executed through the Director of Public Relations. In the event of any disagreement between the committee and the Council or the Executive Committee as to any activity or policy, the decision of the Council, after full discussion and hearing, shall be final.

The committee shall make recommendations to the Council for approval as to the time, the place, the number of meetings and the budget of the Department of Public Relations, provided that the Secretary shall call the first meeting of the committee within thirty (30) days following the annual meeting of the Association.

The Director of Public Relations shall be appointed by the Council (after consultation with the Committee on Public Relations) annually at the organization meeting of the Council. He shall serve

at the pleasure of the Council and the Committee. He shall act under the supervision and instruction of the chairman of the committee in such matters as shall be approved and sanctioned by the committee, and be responsible to the committee.

The Council shall arrange with the general counsel to give the committee all legal aid.

The committee shall annually at its first meeting elect its own chairman, subject to the approval and confirmation of the Council. The Secretary of the Association shall be ex officio secretary. A majority of the committee shall constitute a quorum.

Section 19.—Physicians' Benevolence Committee

The Physicians' Benevolence Committee shall consist of three (3) members whose appointments and terms of office shall be as provided in Section 2 of this Chapter.

The committee shall be responsible to the Council and the House of Delegates for all of its activities.

The committee shall administer those funds, of this Association, hereinafter designated as comprising the Physicians' Benevolence Fund.

The committee's administration of said fund shall be subject to the provisions of this section.

(a) The funds which may from time to time be allocated to it, from the general funds of the Association, by the Council, are the funds for this committee.

(b) All bequests, voluntary contributions, and donations, from any source whatever, that may be received by this Association for the express and implied purpose of aiding needy members, and

(c) All other funds from whatever source derived, except Accounts Receivable, payments for indebtedness to this Association, Dues and Assessments received by this Association, which the payer, donor, or other person transferring the funds, expresses the intent that such funds shall be for aid to needy members.

Funds contained in the Physicians' Benevolence Fund may from time to time be disbursed by the Physicians' Benevolence Committee.

Section 20.—Publication of Committee Reports in Pre-Convention Bulletin

Reports of the standing and special committees, as approved, deleted or modified by the Council, shall be published in a pre-convention bulletin or in the official journal of the month preceding the date of the annual session of the Association. Such reports must be in the hands of the Secretary-Treasurer at least sixty days in advance of the annual session.

If a committee fails to send in its report in proper time, the name of the committee and the names of its members shall be printed as above indicated, with a statement that the committee failed to send in its report, and the Council, subject to the approval of the House of Delegates, shall be empowered under such conditions to make such changes in the personnel of the committee as in its judgment may be deemed best.

Section 21.—Additional Committees

The House of Delegates and the Council are authorized and empowered to appoint special committees, with special instructions as to work to be undertaken, whenever it is deemed impractical or improper for the contemplated duties to be performed by a standing committee.

CHAPTER VIII.—ELECTION OF OFFICERS: TERMS

Section 1.—President-Elect—When and How Elected: Term of Office

The House of Delegates at each Annual Session thereof shall elect the President-Elect to serve until the adjournment of the final meeting of the House of Delegates at its next Annual Session. At the conclusion of the final meeting of the House of Delegates at its next Annual Session, such President-Elect shall assume the office of President, and serve as such for the term of one year thereafter, or until his successor assumes office.

Section 2.—Speaker and Vice-Speaker of House—When Elected: Term of Office

The House of Delegates shall at the Annual Session thereof elect a Speaker of the House of Delegates and a Vice-Speaker of the House of Delegates, each to serve for the term of one year, or until their successors are elected and assume office. The Speaker and Vice-Speaker shall be members of the House of Delegates at the time of their election.

Section 3.—Delegates to the American Medical Association

The House of Delegates shall elect delegates and alternates to the House of Delegates of the American Medical Association in accordance with the Constitution and By-Laws of that organization.

Section 4.—Officers Elected by House of Delegates

Those officers who under the Constitution are elected by the House of Delegates shall be elected at the second meeting of the House at the Annual Session thereof.

Section 5.—Election of Ballot: Number of Votes Necessary

(a) All elections of officers shall be by ballot; provided, that by a two-thirds vote of the members present and acting election by ballot may be waived.

(b) A majority of the votes cast shall be necessary to elect any officer.

(c) In case no nominee receives a majority of the votes on the first ballot the nominee receiving the lowest number of votes shall be dropped and a new ballot taken. This procedure shall be continued until one of the nominees receives a majority of all the votes cast, when he shall be declared elected.

Section 6.—Election of District Councilors

At least twenty-four hours prior to the second meeting at each annual session of the House of

Delegates the delegates from those districts in which Councilor vacancies are about to occur shall separately meet, and in each district the delegates shall elect a chairman and a secretary. At such caucus the delegates in each district shall by nomination, secret ballot and majority vote of the delegates present elect a district Councilor from such district to serve for the ensuing term. The chairman of the district delegation shall then report at the second meeting of the House of Delegates the results of the election, and when such report is made the member elected shall thereupon assume office as a district Councilor. The time and place of the caucus of each district delegation shall, in the absence of unanimous written consent by the delegates from the district fixing time and place, be fixed by the Speaker and announced at the first meeting of the House of Delegates at each annual session. In the event that at any district caucus no person receives a majority vote for district Councilor after repeated ballots, the chairman of the caucus shall report such fact at the second meeting of the House of Delegates and shall also report the names of all nominees submitted to the caucus, whereupon the House of Delegates shall proceed to elect from such nominees the district Councilor from such district.

Section 7.—When Terms of Office of Speaker, Vice-Speaker and Councilors Begin

The terms of office of the Speaker and Vice-Speaker of the House of Delegates (which terms are herein generally stated to be one year) and the terms of office of the Councilors (which terms are herein generally stated to be three years) shall commence immediately upon the adjournment of the last meeting of the House of Delegates of the Annual Session of the Association at which such officers are elected, and shall continue up to the adjournment of the last meeting of the House of Delegates at the Annual Session of the Association of the year in which the term of office ends.

Section 8.—Officers to Hold Office Until Successors Are Elected and Assume Office

Every officer shall hold office until his successor has been elected and has assumed office either in person or by announcement.

Section 9.—Vacancies in Office

(a) In case of vacancy in the offices of both President and President-Elect, the chairman of the Council shall act as the Acting President until a President is elected at the next Annual Session of the House of Delegates.

(b) The Council by appointment shall fill any vacancy in office not otherwise provided for in the Constitution or these By-Laws, which occurs during the interval between the Annual Sessions of the House of Delegates. Such appointee shall serve until the next Annual Session or until his successor has been elected and has assumed office.

CHAPTER IX.—POWERS AND DUTIES OF OFFICERS

Section 1.—Duties of the President

The President shall preside at all meetings of the Association.

He shall appoint all committees not otherwise provided for; he shall deliver an address at the regular session at such time as may be arranged, and shall perform such other duties as custom and parliamentary usage may require, or as the House of Delegates or the Council may direct.

He shall be the real head of the profession of the state during his term of office, and, as far as practicable, shall visit, by appointment, the various sections of the state and assist the Councilors in building up the component societies, and in making their work more practical and useful. The Council shall decide what portion of the expenses incurred on his official visits shall be paid by the Association.

He shall be ex officio a member of all committees of the Association.

Section 2.—Duties of the Secretary-Treasurer, Executive Secretary and Field Representatives

The duties of the Executive Secretary and Field Representatives may be such as are delegated to them by the Council, and may be any and all duties as are specified under the various provisions of this section.

(a) *Minutes.* The Secretary-Treasurer (who may also be referred to as Secretary or Treasurer) shall attend the general meetings of the Association, the meetings of the House of Delegates, of the Council and of the Executive Committee, and shall keep minutes of their respective proceedings in separate record books.

(b) *Custodian of Records.* He shall be custodian of all record books and papers belonging to the Association. He shall have the custody of the seal of the Association.

(c) *Contracts.* He shall countersign all contracts, agreements, conveyances, transfers or other instruments to which the Association is a party, the execution of which has been authorized by the House of Delegates or Council.

(d) *Checks.* The Secretary-Treasurer shall sign and issue checks or drafts only upon vouchers approved and signed by at least two of the members of the Auditing Committee or as otherwise provided.

(e) *Advertisements in Association Publications.* The Secretary-Treasurer, subject to instructions by the Council, shall carefully examine, approve, modify or reject all material for advertising in any of the publications of the Association, and shall, in all cases of doubt, refer such proposed advertisements to the Executive Committee or the Council for decision. He shall, with the approval of the Council or the Executive Committee, execute, for the Association, written contracts relating to advertising in the form approved by the Council, subject to instructions by the Council.

(f) *Registrar at Annual Sessions.* He shall provide for the registration of the members and delegates at the Annual Session.

(g) *Index Register of California Medical Licentiates.* He shall, with the cooperation of the secretaries of the component societies, keep a card-index register of all the licensed practitioners of the state by counties, noting the status of each in relation to his component society; and shall transmit a copy of this list to the American Medical Association, transmitting to its secretary each month a report containing the names of new members and the names of those dropped from the membership roster during the preceding month.

(h) *Register of Component Societies, Their Members and Officers.* He shall keep a register of all component societies, their respective officers, and of all members of the Association, with their addresses, and shall compile an annual directory of the same. He shall print in the January or February issue of the official journal the number of active members of each component society as of November 1st of the preceding year.

(i) *Notices.* He shall give all notices required by the Constitution and By-Laws of this Association, or by order of the Council, or of the Executive Committee, or by law.

(j) *Correspondence and Notifications to Committees.* He shall conduct the official correspondence, promptly notifying members of meetings, officers of their election, and committees of their appointment and duties, as outlined in the motions creating such committees. Such notifications shall be made in writing.

(k) *Assistants.* He shall employ and dispense with such assistants as may be ordered by the Council. The Council by resolution may outline the scope and duties of special employees acting under the Secretary-Treasurer.

(l) *Annual and Other Report Forms.* He shall supply all component societies with the necessary forms for making their annual and other reports to this Association.

(m) *Salary.* The amount of his salary shall be fixed by the Council.

(n) *Bond.* He shall give bond in such sum as may be fixed by the Council. The Association shall pay the premium on said bond.

(o) *Duties as Treasurer.* He shall as Treasurer demand and receive all funds due the Association, together with bequests and donations, and shall promptly deposit the same in one of the depositaries thereof; and shall keep a proper and accurate record thereof, as well as of all funds disbursed by the Association.

(p) *Audits and Reports.* He shall subject his accounts to such examination or audit as the House of Delegates or Council may order.

He shall annually render an account of his work, and of the state of the funds in his hands, and make a report on the same and of his work as Secretary-Treasurer to the House of Delegates. He shall in writing also make such other reports as the House of Delegates or Council may request.

(q) *Disbursement of Association Moneys.* He shall pay out the money of the Association only upon a check or draft as otherwise provided herein.

(r) *Other Duties.* He shall perform such other duties as the Council or Executive Committee may direct.

Section 3.—Duties and Powers of the Chairman of the Council

The Chairman of the Council shall preside at all meetings of the Council. He shall sign all contracts and agreements, conveyances, transfers or other instruments (other than advertising contracts) to which the Association is a party, the execution of which has been authorized by the House of Delegates or the Council. He shall sign all checks or drafts for the disbursements of funds of the Association. He shall, on behalf of the Council, deliver its annual report to the House of Delegates. He shall perform such other duties as may be imposed upon him by the Constitution or these By-Laws.

Section 4.—Duties of Vice-Chairman of the Council

The Vice-Chairman of the Council, in the absence or inability of the Chairman to act, shall be vested with all the powers and shall perform all the duties of the Chairman.

Section 5.—Duties and Powers of the Speaker

The Speaker of the House of Delegates shall preside at its meetings and shall perform such other duties as parliamentary usage may require. He shall appoint all committees authorized by the House of Delegates, unless otherwise provided.

Section 6.—Duties of Vice-Speaker

The Vice-Speaker shall act as Speaker in the absence of or at the request of the Speaker.

Section 7.—Duties of the Editor

The Editor and Associate Editor or Editors shall compile, edit and have charge of the official journal of the Association and such other publications as the Council or the House of Delegates may instruct him to undertake.

CHAPTER X.—FUNDS, PROPERTY, BUDGET AND ASSESSMENTS

Section 1.—Preparation of Budget

The Auditing Committee, prior to December 1 of any year, shall submit to the Executive Committee, for consideration at its December meeting, a budget under which the Association shall work in the fiscal year following the next annual session.

The Executive Committee, after consideration of the Auditing Committee's proposed budget, shall submit the same to the Council, prior to the spring meeting of the Council, with a report of its own containing suggested changes, additions or comments.

The Council in turn shall consider the two proposed budgets so submitted, and shall then make a

final draft of a proposed budget for the Association, to be submitted to the House of Delegates at the next annual session.

Section 2.—Dues

(a) The Council shall recommend to the House of Delegates the amount of the annual dues or assessments of Active, Associate, Affiliate and Retired members of the Association.

(b) Honorary Members shall not be required to pay any dues or assessments, annual or special.

Section 3.—Reduction of Dues

The House of Delegates may reduce annual dues of active members, as follows:

(a) Those active members who have been in the practice of medicine for less than one year (on the first day of the calendar year for which such dues are payable), may be reduced to one-fourth regular dues;

(b) Those active members who have been in the practice of medicine for less than two years (on the first day of the calendar year for which such dues are payable), may be reduced to one-half regular dues;

(c) Those active members who have been in the practice of medicine for less than three years (on the first day of the calendar year for which such dues are payable), may be reduced to three-fourths regular dues.

Section 4.—Annual Dues and Assessments

(a) *When Payable.* The annual assessment or dues shall be payable on or before January 1 of the year for which they are levied.

(b) *County Secretaries to Collect Dues.* The secretary of each component society shall cause to be collected and shall forward to the office of the Association the dues and assessments for its members.

(c) *Record of Fact of Payment of Dues.* The record of payment of dues and assessments on file in the office of the Association shall be final as to the fact of payment by a member and as to his right to participate in the business and proceedings of the Association and of the House of Delegates.

(d) *Dues of New Members; Amount Payable.* All doctors of medicine becoming active members of this Association shall pay to this Association the annual dues payable by active members for the period for which membership is obtained, except that the Council may, in its discretion, with respect to all new members who acquire membership after July 1 in each year, require payment of only one-half of the annual dues for said year. Such payment shall entitle such new member to all the rights of active membership in this Association until the end of the current calendar year.

Section 5.—Bequests, Legacies, Donations and Gifts

The Association may receive through the Council or for the benefit of the Association through any corporation which may be formed pursuant to the Constitution, such bequests, legacies, donations and gifts as the Council shall deem it proper and suitable to accept.

Section 6.—Funds and Moneys: Deposit and Withdrawal

All funds and moneys of the Association by whomsoever received shall be promptly forwarded to the Secretary-Treasurer of the Association and deposited by him in a depositary of the Association.

No demands or claims against the Association shall be paid and no funds or moneys of the Association withdrawn from any depositary thereof except upon written voucher approved by the signature of at least two members of the Auditing Committee or by a majority vote or written approval of a majority of all the members of the Executive Committee on check or draft signed by any two of the following: The Chairman of the Council; the Vice-Chairman of the Council (only in the absence of the Chairman); Chairman of the Auditing Committee; the Secretary-Treasurer.

Section 7.—Revolving Fund

A revolving fund in such amount as may from time to time be fixed by the Council shall be deposited with the Secretary-Treasurer from which fund immediate cash demands may be paid.

Section 8.—Surplus Funds From Journal and Publications

On authorization therefor by the House of Delegates or the Council, any surplus funds arising from the operation of the official journal or other publications of the Association may be applied and used for any purposes deemed suitable or may be delivered and paid over to any corporation which may be formed pursuant to Article VIII, Section 1, of the Constitution.

CHAPTER XI.—REFERENDUM AND PETITION

Section 1.—Reference of Resolutions to Vote of Members

The House of Delegates may at any time, by a majority vote of those present, refer any resolution or motion pending before it to all of the active members of the Association for their vote for or against such resolution or motion. The Council may, by a two-thirds vote of all of its members and at any time within thirty (30) days after action was taken, refer any resolution or motion adopted by the House of Delegates to all of the active members of the Association for their vote for or against such resolution or motion. In addition, the Council may at any time, by a two-thirds vote of all of its members, submit any resolution or motion pending before it to all of the active members of the Association for their vote for or against such resolution or motion.

Section 2.—Form of Referendum: Arguments

The body referring any resolution or motion to the active members of the Association may, in the motion of reference, determine the form of the question to be submitted. In the event the motion of ref-

erence does not determine the form of the question to be submitted, then the form thereof shall be fixed and determined by the Council. Written arguments for and against the resolution or motion, not exceeding 1000 words each, may be submitted by any member of the Association to the presiding officer of the referring body within fifteen (15) days of the vote of reference. Such presiding officer may choose one argument on each side and same shall then be printed and mailed with the ballots.

Section 3.—Manner of Voting; Time of Voting; Canvass

All references to the membership under this article shall be by mail ballot. The time within which each member shall cast his vote may be fixed in the motion of reference, and if not so fixed shall be fifteen days from the date of mailing ballots. Each vote must be in writing and the same must be placed in a sealed envelope bearing on the corner thereof the name of the voter. The envelope shall be mailed or delivered to the Secretary's office. The canvass thereof shall be made by a committee on referendums to be appointed, in the case of reference by the House of Delegates by the Speaker of the House, and in the case of reference by the Council by the Chairman of the Council. The Secretary shall deliver to such committee all ballots timely received, and the committee shall canvass the vote and report the results thereof immediately to the Secretary.

Section 4.—Effect of Referendum

To be considered adopted, any resolution or motion submitted to the membership by referendum shall require the same proportionate affirmative vote of those voting that such resolution or motion would have required to be adopted by the body (House of Delegates or Council) from which such resolution or motion was referred. Any resolution or motion submitted to a referendum and adopted shall have the same force and effect as though adopted in the body from which it was referred, and shall be considered as having been so adopted by such body. A referendum shall not be effective or binding unless a majority of the active members vote thereon.

Section 5.—Petitions

Any 100 active members or any component society may petition the House of Delegates or Council on any matter and such petition must thereupon be heard and considered at the next ensuing regular meeting of such body.

CHAPTER XII.—MISCELLANEOUS

Section 1.—Ethics

The principles of medical ethics as promulgated from time to time by the American Medical Association and by the California Medical Association are and shall be the principles of medical ethics of this Association and the component societies thereof, and shall regulate and govern all members thereof.

Interpretation of ethics about which any controversy may arise or exist shall be submitted to the Council of this Association, and its interpretation and ruling thereon shall be final.

Section 2.—Rules of Order

In the absence of any provision in the Constitution or these By-Laws, all meetings of the Association, of the House of Delegates, of the Council, and of committees shall be governed by the parliamentary rules and usages contained in the current edition of Roberts' "Rules of Order."

CHAPTER XIII.—AMENDMENTS

Section 1.—Amendments—Vote and Procedure

These By-Laws may be amended by the House of Delegates at any meeting of any session thereof by the affirmative vote of at least two-thirds of the qualified members thereof present and acting; provided, that any proposed amendment has been submitted in writing to the House of Delegates at least twenty-four hours previous to being voted upon.

CHAPTER XIV.—REPEAL OF ALL EXISTING BY-LAWS

Section 1.—Repeal of Existing By-Laws

All chapters and all sections and parts of all chapters of the existing By-Laws of this Association are hereby repealed.

Regional Medical and Surgical Institutes

For this fall and winter the California Medical Association, through its Committee on Postgraduate Activities, is preparing a new series of regional postgraduate programs which are planned to become an annual event. Each one of these medical and surgical institutes will have a two-day program sponsored by a local county medical society and staffed by one of the medical schools. A registration fee of five dollars will be charged which entitles the registrant to attend any one or all of the programs, no two of which are to be alike.

The first program will be known as the Santa Barbara Medical and Surgical Institute. This institute will be held in Santa Barbara, October 12, 13, 1950, sponsored by the Santa Barbara County Medical Society and staffed by the College of Medical Evangelists under the direction of Dr. H. M. Walton, chairman of the section on postgraduate and graduate medical education of the College of Medical Evangelists.

The Committee on Postgraduate Study consists of Dr. H. V. Findlay, chairman, with Drs. L. Gordon Fiske, Benjamin H. Huggins, E. L. Markthaler, and Neville T. Usher. The meetings will be held in the Santa Barbara County Medical Society club rooms in the Bissell Auditorium at the Cottage Hospital.

The program as at present planned follows:

SANTA BARBARA MEDICAL AND SURGICAL INSTITUTE

October 12, 13, 1950

Thursday, October 12

8:30-9:30 a.m.—Registration.

9:30-10:30 a.m.—Clinical-Pathological Conference—Carrol S. Small, M.D.

10:30-11:15 a.m.—Borderline Psychiatric Problem Cases—George T. Harding, M.D.

11:15-11:30 a.m.—Intermission.

11:30-12:00 noon—Postgraduate Activities of the C.M.A.—John C. Ruddock, M.D.

12:00-2:00 p.m.—Luncheon: Discussion groups with Institute speakers.

2:00-2:30 p.m.—Surgical Conditions in Infancy and Childhood—J. Norton Nichols, M.D.

2:30-3:00 p.m.—Differential Diagnosis of Jaundice — John E. Peterson, M.D.

3:00-3:15 p.m.—Intermission.

3:15-4:00 p.m.—Differential Diagnosis of Intracranial Tumor and Vascular Disease—Cyril B. Courville, M.D.

4:00-4:30 p.m.—Management of Obstetrical Complications —Ralph J. Thompson, M.D.

4:30-5:00 p.m.—Question and answer period.

7:00-9:00 p.m.—Dinner: "Medico-Legal Pitfalls in Medical Practice"—Louis J. Regan, M.D., LL.B.

Friday, October 13

9:00-9:30 a.m.—Use of Radioactive Iodine in Diagnosis and Treatment of Thyroid Disease—Mortimer E. Morton, M.D., Ph.D.

9:30-10:15 a.m.—Use and Abuse of Antibiotic Therapy—Albert G. Bower, M.D.

10:15-11:00 a.m.—Office Urology—Roger W. Barnes, M.D. Discussion, H. V. Findlay, M.D.

11:00-11:15 a.m.—Intermission.

11:15-12:00 noon—Hyperventilation — Physiological and Clinical Significance—James J. Short, M.D.

12:00-2:00 p.m.—Luncheon: Discussion Groups with Assembly speakers.

2:00-2:45 p.m.—Iatrogenesis in the Field of Cardiac Diseases—William Paul Thompson, M.D.

2:45-3:15 p.m.—Value of Anorectal Examination in General Practice—Malcolm R. Hill, M.D.

3:15-3:30 p.m.—Intermission.

3:30-4:15 p.m.—ACTH and Cortisone—Physiological and Therapeutic Considerations—E. Kost Shelton, M.D.

4:15 p.m.—Question and answer period.

On November 2 and 3, 1950, in Fresno, the second program, known as the Fresno Medical and Surgical Institute, will be held at the Hotel Californian in Fresno. This is being prepared by a committee with Dr. C. S. Mitchell, chairman, supported by Drs. C. A. Cabell, R. A. Donald, E. R. Freeto, G. W. Olson, T. A. Collins and Joseph Balkovitz.

The lecturers and conference leaders will be furnished by the University of California at Los Angeles School of Medicine. Dr. S. J. Weinberg, head of postgraduate instruction, has selected the subjects and lecturers in conference with the local committee.

The program Thursday, November 2, will be led off with a lecture, "Preventive Medicine," by Dr. Norman B. Nelson, associate professor of preventive medicine, at 9:30 a.m. He will be followed by Dr. Charles M. Carpenter, professor of infectious diseases, speaking on the subject of "Viral and Rickettsial Diseases." At noon there will be a round table conference and luncheon. In the afternoon Dr. Daniel G. Morton, professor of obstetrics and gynecology, will speak on a selected subject in obstetrics. The second subject for the afternoon will be "Radiology" by Dr. Raymond L. Libby, associate professor of radiology.

On the second day, Friday, November 3, the morning session will be held at the County Hospital with presentation of surgical cases at 9:00 a.m., under the direction of Dr. William H. Muller, Jr., assistant professor of surgery. At 10:30 Dr. William N. Valentine, chief of the hematological section, will present a group of medical cases.

At the noon luncheon the matter of "Medical Preparation for Atomic Defense" will be discussed.

At 2 p.m., Dr. Samuel H. Bassett, chief of research section, will lecture on "Metabolism with Reference to ACTH and Cortisone." Dr. John M. Adams, professor of pediatrics, will close the session with discussion of a subject in the field of pediatrics.

The Riverside Medical and Surgical Institute is planned for January 1951. The program is now in the process of formation. Lectures will be from the staff of the Medical School of the University of Southern California under the direction of Dr. Ed-

ward Rosenow, Jr., director of postgraduate education, in conference with the Riverside County Medical Society Postgraduate Study Committee. This committee is headed by Dr. Franklin B. Mead, Dr. Helen Clark and Dr. Hugh Stephens.

The Sacramento Medical and Surgical Institute, scheduled for March 1951, will be staffed by the Stanford University School of Medicine under the direction of Dr. Wm. H. Northway, assistant dean. The meeting will be held under the auspices of the Sacramento Society for Medical Improvement. Dr. Herbert W. Jenkins, chairman of the local committee, will be assisted by Dr. Chas. J. Wallace, Jr., and others.

The Santa Rosa Medical and Surgical Institute will be held in Santa Rosa in March 1951 in the auditorium of the high school. The local committee is headed by Dr. W. E. Rogers, chairman, with Drs. Carroll Andrews, J. L. Spears, A. Morse Bowles, and Frank E. Sohler.

The program will be staffed by the University of California under the direction of Dr. Stacey R. Mettier, head of postgraduate instruction, University of California School of Medicine.

Further information regarding any of these institutes may be had from Dr. C. A. Broaddus, Director of Postgraduate Activities, 1036 N. Center Street, Stockton 3, California.

In Memoriam

Brazelton, Clara M. Holmes. Died in Oakland, July 20, 1950, aged 83, from chronic valvular disease. Graduate of Cooper Medical College, San Francisco, 1895. Licensed in California in 1896. Dr. Brazelton was a member of the Alameda County Medical Association, and a life member of the California Medical Association.

✤

Eaves, James. Died in Oakland, July 3, 1950, aged 66, of a heart attack. Graduate of the University of Edinburgh Faculty of Medicine, Edinburgh, 1910. Licensed in California in 1912. Dr. Eaves was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

Elliott, Frances P. Died in San Diego, July 12, 1950, aged 78, after a long illness. Graduate of Rush Medical College, Chicago, 1907. Licensed in California in 1921. Dr. Elliott was a member of the San Diego County Medical Society, and a retired member of the California Medical Association.

✤

Flau, Norman C. Died near Barton Flats, July 18, 1950, aged 29, when his car plunged over a cliff. Graduate of the University of Illinois College of Medicine, Chicago, 1945. Licensed in California in 1948. Dr. Flau was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

Schimmenti, John M. Died in Oakland, July 19, 1950, aged 51, of a heart attack. Graduate of Columbia University College of Physicians and Surgeons, New York, 1923. Licensed in California in 1926. Dr. Schimmenti was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

Thomas, Victor E. Died in Arcadia, July 11, 1950, aged 51, of a heart attack. Graduate of Cornell University Medical College, New York, 1927. Licensed in California in 1927. Dr. Thomas was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

Walsh, Frank D. Died in Oakland, June 28, 1950, aged 75, of carcinoma of the rectum. Graduate of the College of Physicians and Surgeons of San Francisco, 1898. Licensed in California in 1898. Dr. Walsh was a member of the Alameda County Medical Association, and a retired member of the California Medical Association.

Questions and Answers about C. P. S.

Question: Does C.P.S. pay for orthopedic appliances, cast materials, medications, materials used in injections, drugs, expensive dressings, or similar adjuncts to medical care in the doctor's office?

Answer: No. These items are chargeable to the patient because they are not included in the benefits of C.P.S. contracts.

Question: Are physiotherapy and diathermy paid for by C.P.S.?

Answer: No. These services are not included in any C.P.S. contract.

Question: Is it possible for a physician-member or members of his office staff (nurses, secretaries, technicians, etc.) to join C.P.S. without forming a C.P.S. group for enrollment?

Answer: Yes. A C.P.S. group for physician-members and their staffs has been in existence for some time and it is always open to new members who qualify. The family dependents of such persons may also be included. To obtain additional information, contact the C.P.S. Physician Relations Department in San Francisco or Los Angeles.

Question: What medical services does the C.P.S. fee for obstetrical cases include?

Answer: The female subscriber member on a two-visit-deductible contract is entitled to obstetrical benefits, if delivery occurs aften ten consecutive months of membership. C.P.S. pays a flat fee to the physician for services which include prenatal, delivery and postnatal care, and laboratory procedures ordered in connection with the pregnancy. The first two visits, the mother's Wassermann examination, circumcision and care of the baby, are not included in the fee and should be billed to the patient.

Question: How do I bill C.P.S. for accident cases where there is a possibility of third party liability?

Answer: Follow the routine billing procedures. However, payment of the claim will be expedited if a short note accompanies the bill, indicating how the accident occurred and the possibility that there will be litigation or third party responsibility in regard to the medical fees.

Question: What x-ray and laboratory services are provided by the medical-service-while-hospitalized contract?

Answer: A C.P.S. member enrolled under this contract is entitled to the following x-ray and laboratory services, *if he is a registered bed patient in a licensed hospital and if he is eligible for medical benefits for the condition being treated:* x-ray examinations, urinalyses, complete blood counts, coagulation studies and smears which are done in connection with the ailment being treated. Under the *surgical* portion of the contract, this member also would be entitled to x-rays ordered by the physician in connection with fracture or dislocation cases, whether in or out of the hospital.

Question: I have difficulty in securing the special veterans' prescription blanks. Must I use these in prescribing for veterans, and if so, where do I obtain a supply?

Answer: It is not absolutely necessary to use the special prescription forms. You may use your own provided that you write in the veteran's name and claim number and also indicate that the bill is to be sent to the California Pharmaceutical Association.

It is also essential that just above your signature you write, "I am authorized to treat and prescribe for the above Veterans Administration patient."

Inasmuch as these requirements make necessary a considerable amount of extra writing, it is much more convenient to use the regular prescription form. Every pharmacy which is a member of the California Pharmaceutical Association, and which has signified a desire to fill veteran prescriptions, has a supply of these forms on hand, and will furnish them to you free of charge on request. A telephone call to your usual pharmacy will probably bring you a supply, but if the pharmacy is not a member and cannot inform you which pharmacies in your district are, write to the above association for additional information; the address is 356 South Spring Street, Los Angeles 13, California.

Question: Do I have to report in detail all laboratory and x-ray procedures performed on veteran patients?

Answer: Yes. Each veteran's treatment report is reviewed by a medical board and becomes a part of his permanent medical record. It is important, therefore, that all reports should be submitted in sufficient detail to constitute a file adequate for such a medical review and record.

Question: Among my C.P.S. patients are a husband and wife who are not members of the same C.P.S. group. Both are employed. The husband is enrolled in the group where he works and the wife is enrolled where she works. Does this fact mean that I cannot base my fees on their combined income?

Answer: No. The application of the C.P.S. income clause does not depend on the husband and wife both belonging to the same group. The income clause permits doctors to bill patients directly for the difference between C.P.S. fees and the doctor's usual fee for services rendered, *if annual gross family income exceeds $3,600.* Thus, if the gross income of a family is more than $3,600 per year, the doctor may bill them directly for the difference between his own and C.P.S. fees — regardless of whether the various family members are enrolled in the same or different C.P.S. groups.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Dr. Charles M. Carpenter, professor and chairman of the department of infectious diseases in the University of California at Los Angeles School of Medicine, last month was awarded a citation by the University of Rochester for distinguished service in the field of infectious diseases.

* * *

Orthopaedic Hospital, Los Angeles, will present the fourth in a series of short courses in the over-all care of **patients with poliomyelitis,** for physicians, October 9 through 12, 1950, aided by a grant from the National Foundation for Infantile Paralysis.

The course, under the direction of Charles L. Lowman, M.D., includes demonstration and discussion of all phases of patient care with emphasis given to coordination of services making up the treatment team.

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Three courses designed for laboratory technicians will be opened by University of California Extension with the beginning of its 1950 fall semester during the weeks of September 11 and 18.

A refresher course for laboratory technicians will feature a series of lectures by various authorities. Lecturers and their topics are: Dr. Henry Henstell, hematology; Dr. Milton G. Levine, serology; Dr. Everett E. Lund, parasitology and protozoology; Leslie Siewert, bacteriology. A series of biochemical methods lectures is also planned. The course will begin September 13 at 7:30 p.m. at 1027 Wilshire Blvd. and will meet one evening each week thereafter.

A course in **clinical chemistry** for laboratory technicians will be conducted on the U.C.L.A. campus each Tuesday evening from 7:00 to 9:30, beginning September 19.

A course in **problems in serology** will be held in Wadsworth Hospital's medical library each Wednesday evening from 7:00 to 9:00 starting on September 20. This class, teaching principles and techniques of serologic reactions, will be conducted by Edwin T. Peterson, chief serologist of the Veterans Administration Hospital.

Information, class bulletins and advance enrollments are available from University of California Extension, Los Angeles 24, or 813 South Hill Street, Los Angeles 14. Enrollments may also be made at the opening session of each class.

SAN FRANCISCO

Appointment of **Dr. J. C. Geiger** as consultant in public health to the Surgeon-General of the Navy was announced recently by the Department of the Navy, Bureau of Medicine and Surgery. Dr. Geiger was called upon by Surgeon-General C. A. Swanson, rear admiral (MC) to give consultation service to naval medical activities in the San Francisco and Pacific areas.

SAN JOAQUIN

Dr. J. Frank Doughty of Tracy was elected president of the board of trustees of **California Physicians' Service** at the annual organizational meeting in San Francisco. Dr. Doughty, who last year was first vice-president of the C.P.S. board, succeeds Dr. Lowell S. Goin as president.

Programs for eight postgraduate lectures making up the 12th annual fall series have been announced by the **Stockton Postgraduate Study Club.**

All meetings except for the dinner meeting concluding the series are to be held in the occupational therapy building on the grounds of the Stockton State Hospital. The usual registration fee of $10 will be charged.

The program follows:

September 14, 1950: "Psychosomatic Medicine" — Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado School of Medicine. Chairman, Dr. James J. Heffernan.

September 28, 1950: "Diagnosis of Operable Cardiovascular Lesions"—Dr. Mary Olney, associate clinical professor of pediatrics, University of California School of Medicine. Chairman, Dr. Louis Armanino.

October 12, 1950: "Clinical Physiology of ACTH and Adrenal Cortical Hormone"—Dr. Lawrence Kinsell, associate clinical professor of medicine, University of California School of Medicine. Chairman, Dr. Virgil Gianelli.

October 19, 1950: "Hyperthyroidism and Exophthalmos" —Dr. Edward Maumenee, professor of ophthalmic surgery, Stanford University School of Medicine. Chairman, Dr. Alfons F. Tipshus.

October 26, 1950: "Protein Metabolism"—Dr. Harold A. Harper, professor of biology, University of San Francisco. Chairman, Dr. William Brock.

November 7, 1950: "New Concepts Regarding Diagnosis and Treatment of Pancreatitis"—Dr. Andrew Conway Ivy, professor of physiology and vice-president of the University of Illinois.

November 30, 1950: "Regional Anesthesia"—Dr. Charles Fletcher McCuskey, associate clinical professor of surgery (anesthesia), University of Southern California School of Medicine. Chairman, Dr. John T. McNally.

December 14, 1950 (Dinner Meeting): "The Antibiotics with Special Reference to Bacterial Resistance"—Dr. George Cupp Griffith, clinical professor of medicine, University of Southern California School of Medicine. Chairman, Dr. C. A. Broaddus.

TEHAMA

Dr. Charles R. Milford has been appointed health officer of the city of Red Bluff. He succeeds Dr. James L. Faulkner in that position.

GENERAL

The **fourth clinical session of the American Medical Association,** which, according to official announcement, is "designed primarily for the general practitioner," will be held in Cleveland, December 5-8.

"Outstanding clinical teachers with recognized ability as speakers will headline the scientific demonstrations," the announcement said. "Actual cases will be presented and discussed. Diagnoses, treatment and preventive measures as they fit into daily practice will receive the greatest attention.

"Each clinical session will be limited to an attendance of 100 physicians. These small groups will make it possible for

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

SEPTEMBER 1950

University of Southern California, School of Medicine

Clinical Review of Internal Medicine—12 weeks full-time from September 11 to December 1, 1950.

Cardiology and Vascular Disease—12 months, full-time from September 11, 1950 to September, 1951.

Hematology—12 weekly, 2-hour evening lectures. Clinical application of newer diagnostic methods in cardiology. Given at Los Angeles County Hospital.

Recent Advances in Surgery, Obstetrics and Gynecology—Given in San Diego.

Electrocardiography—Given at Centinela Hospital, Inglewood.

University of California, San Francisco

Ophthalmology—September 11 through 15, 1950. Toland Hall, University of California Hospital. Address: Stacey R. Mettier, M.D., Head of Postgraduate Instruction Medical Extension, University of California Medical Center, San Francisco 22.

University of California at Los Angeles

Symposia on Therapy in Metabolic, Endocrine and Gastrointestinal Diseases—September 20 to December 13, 1950. Wednesday evenings, 8 to 10 p.m.

Surgical Anatomy—September to December, 1950.

Stanford University, School of Medicine

September 11 to 15.

Morning Courses: Monday, Tuesday, Wednesday, Thursday and Friday, 8:30 a.m. to 12 noon.

Course 1—General Surgery
Course 2—Acute Surgical Emergencies
Course 3—Surgical Anatomy
Course 4—Internal Medicine
Course 5—Electrocardiography
Course 6—Diseases of the Chest
Course 7—Pediatrics

Afternoon Courses: 1:30 to 5 p.m.

Course 8—Surgical Anatomy
Course 9—Proctology
Course 10—Fundamentals of Roentgen Diagnosis
Course 11—Fractures
Course 12—Internal Medicine
Course 13—Obstetrics and Gynecology

Address: Stanford School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

OCTOBER 1950

University of California at Los Angeles

Recent Advances in Obstetrics and Gynecology—One week.

NOVEMBER - DECEMBER 1950

University of California at Los Angeles

Ophthalmology.

DECEMBER 1950

University of California at Los Angeles

Internal Medicine—9 months full-time, December 4, 1950 to September 1951.

JANUARY 1951

University of California at Los Angeles

Advanced Hematology—Eight lectures.

the general practitioner to enter actively into the discussion and to inquire about his own cases."

This year's selection for the annual General Practitioner Award, which has come to be regarded as one of medicine's highest honors and a definite step toward increasing recognition of the family doctor, will be made at the Cleveland meeting.

* * *

Announcement has been made by the American Goiter Association of the opening of competition for the **Van Meter Prize Award** for 1951, which will be given for the best essay submitted concerning original work on problems related to the thyroid gland. The recipient of the award will be given $300, and arrangements will be made for the author to present the essay at the annual meeting of the association in Columbus, Ohio, May 24-26, 1951. Two additional essays will be given honorable mention.

The competing essays may cover either clinical or research investigations; should not exceed 3,000 words in length; must be presented in English; and a typewritten double spaced copy in duplicate sent to the corresponding secretary, Dr. George C. Shivers, 100 East Vrain Street, Colorado Springs, Colorado, not later than March 1, 1951.

* * *

The California Society of Internal Medicine will hold its first annual scientific-social meeting in Yosemite, with headquarters at the Ahwahnee Hotel, on September 23 and 24, 1950. The scientific program will be held on Saturday morning and Dr. John Browne, professor of medicine at McGill University, will conduct a symposium on recent developments and experiences with cortisone and ACTH.

Physicians planning to attend the meeting may reserve accommodations by writing to George H. Oliver, traffic manager, Yosemite Park and Curry Company, Yosemite National Park, California. Applications should be accompanied by a $10 deposit for each person who wishes accommodations.

* * *

The board of regents of the **American College of Chest Physicians** has announced the institution of a cash prize award of $250 to be given annually for the best original article, preferably by a young investigator, on any subject relating to chest disease. The prize is open to contestants of other countries as well as those residing in the United States. The winning contribution will be selected by a board of impartial judges and the award, together with a certificate of merit, will be made at the annual meeting of the college which next year will be held in Atlantic City, New Jersey, June 7-10.

Rules for contestants may be obtained from the executive office of the American College of Chest Physicians, 500 North Dearborn Street, Chicago 10.

INFORMATION

The University of California Program in Cancer Research

MICHAEL B. SHIMKIN, M.D., *San Francisco*

Cancer is one of the most important problems of public health in the United States. Cancer, a group of diseases manifested by abnormal growth and behavior of cells, is also an engrossing biological phenomenon. For these reasons, the problem of cancer has attracted ever-growing concern and interest of the public and scientists.

It has been realized that the solution of the cancer problem can be reached only through research. Cancer research is not a discipline separate unto itself, but depends upon simultaneous and coordinated efforts of many scientific disciplines. Its progress is stimulated by fundamental advances in the basic sciences. Cancer research, in turn, makes its contributions to the wider areas of biology, biochemistry and related sciences.

The University of California, on its many campuses, occupies an outstanding position in its abilities to contribute toward the solution of the riddle of cancer. Many of its investigators have made noteworthy advances which have contributed to scientific knowledge regarding cancer. Several events occurred in 1947 which made it possible to strengthen further the cancer research program of the university. More important, the opportunities which occurred three years ago were seized and exploited by close teamwork between the administrative and the research authorities of the university.

1. The Legislature of the State of California indicated its interest in cancer and made an emergency appropriation of $250,000 to the university for cancer research. This allocation has been established on a continuing basis.

2. Important gifts to the university, particularly the Albert C. Hooper Fund and the Emma B. Schutz Fund, increased the endowed funds designated for cancer research at the university to over one million dollars.

3. The expanded and accelerated programs of the National Cancer Institute and of the American Cancer Society substantially increased national funds available for cancer research. In 1947, approximately $270,000 was granted or made available to the university by these two agencies, and the amounts have steadily increased, to $660,000 in 1950.

4. Establishment of the School of Medicine at the University of California in Los Angeles and the organization there of the Institute for Cancer Research, with a private non-profit trust called the California Institute for Cancer Research partially supporting it, expanded the cancer research program in the south.

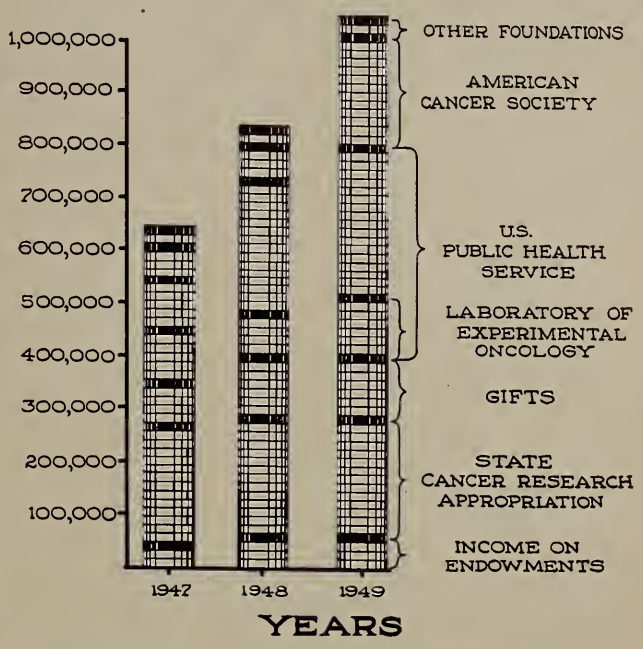

Figure 1.—Financial support of the cancer research program of the University of California, 1947-49.

5. The United States Public Health Service assigned one of the sections of the National Cancer Institute, the Laboratory of Experimental Oncology, to the University of California School of Medicine in San Francisco for the purpose of conducting a collaborative program in cancer research.

On the basis of these developments, the president of the university, in June 1947, called an all-university conference to review the cancer research program. The conference recommended a coordination of activities without encroachment upon the spirit of free inquiry which is essential for scientific endeavor. The president appointed three interlocking committees, widely representative of the main fields of biological research, to advise him on the policies and allocation of funds. These are the cancer research committees of the northern and southern sections and the university-wide Cancer Research Coordinating Committee. The major task of the committees is to stimulate and to coordinate investigations on the origin, prevention and cure of cancer by individuals and research agencies of the university, and to chart a program of cancer re-

Secretary, Cancer Research Coordinating Committee, University of California.

search that will encompass the important phases of the subject.

Further coordination of cancer research and related activities also occurred in the university's two schools of medicine. The School of Medicine in San Francisco organized the Cancer Research Institute, under the guidance of a cancer board, and the School of Medicine in Los Angeles established the Institute for Cancer Research.

The financial support for cancer research at the University of California, as shown in Figure 1, is derived from four major sources:

1. The State of California annual appropriation of $250,000;

2. Income on endowments and individual donations and gifts, which have risen from $97,000 in 1947 to $145,000 in 1949;

3. Grants and allocations from the National Cancer Institute of the United States Public Health Service, including grants made through the Department of Public Health of the State of California, which amounted to $200,000 in 1947 and increased to $440,000 in 1949; and

4. Grants from the American Cancer Society, including allocations from the California division, which have mounted from $69,000 in 1947 to $220,000 in 1949.

In addition, a grant of $125,000 was made from the Damon Runyon Fund for the two-year period 1948-50 to the California Institute for Cancer Research at the Medical Center of the University of California at Los Angeles, and grants from the Jewish Fund for Medical Research and from David R. Trattner and Associates total about $130,000.

These large sums do not include support for the essential training programs in research, encouraged through the medium of cancer research fellowships granted by the National Cancer Institute and the American Cancer Society, as well as by other foundations such as the Jane Coffin Childs Memorial Fund for Medical Research and the Damon Runyon Fund. Thirteen research fellows were working at the university in 1947, and the number increased to 21 in 1949. In addition, three clinical traineeships in cancer, and annual grants of $25,000 and $5,000, respectively, to the university's schools of medicine and dentistry in San Francisco, are available from the National Cancer Institute for the improvement of teaching in cancer.

One of the limiting factors in the development of the cancer research program has been the lack of physical facilities in which to carry on the work. The extensive building programs under way on the San Francisco and Los Angeles campuses, scheduled for completion in 1952, assure additional space for many of the activities. Several large construction grants have also been made specifically for cancer research, as shown in Figure 2. In 1948, the National Cancer Institute allocated one million dollars for the addition of a floor for cancer research to the new hospital and medical science buildings on the San Francisco campus, and in 1949 the School of Medicine at Los Angeles was extended

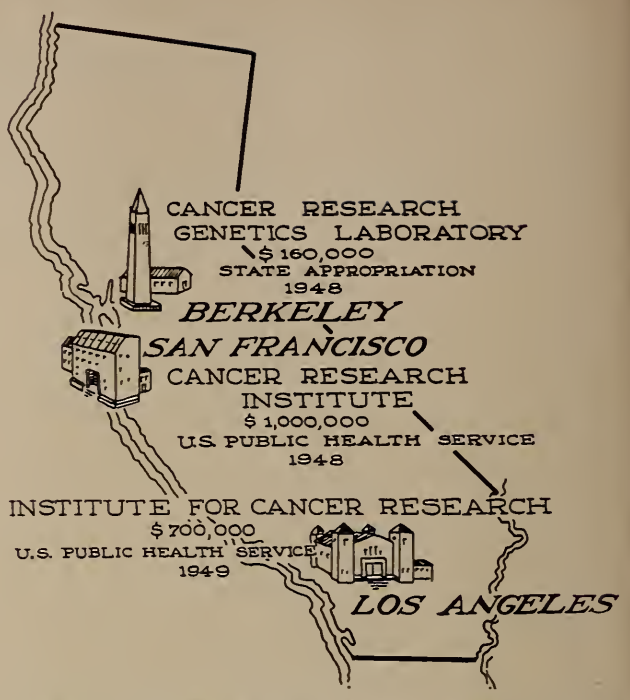

Figure 2.—Building program for cancer research at the University of California.

$700,000 for the construction of a wing on the school to house the Institute for Cancer Research. The State of California in 1948 appropriated $160,000 for the construction of the Cancer Research Genetics Laboratory at Berkeley.

As important to cancer research as any physical facilities or financial support are certain intangible requirements, indicated in Figure 3. A long-range view is one of these essentials. Although increased support of cancer research will increase the chances of success, the results are unpredictable and no estimate can be made of time required to achieve this solution. Continued progress is therefore based on continued adequate support on a long-term basis.

RESEARCH PROGRAM

The investigative approaches to the cancer problem may be divided into five main categories:

1. The study of *carcinogenesis*, or the cause and the formation of neoplastic growth. It is through the understanding of carcinogenesis that the basis of prevention and control of cancer may well be expected.

2. The study of the *nature of the cancer cell*, its chemical and physical characteristics, including its dynamic phases of metabolism, and how such characteristics differ from those of normal cells. Increasing information in this broad field will yield clues to rational approaches to the diagnosis and treatment of cancer.

3. The study of *cancer-host relationships*, or the effects of cancer growth on the organism. This approach involves the investigation of the natural history of the disease in animals and in man, the metabolism and other physiological reactions of cancer-bearing organisms as compared with normal

organisms. A better understanding of this field may reveal the basis for diagnostic tests for the presence of cancer, as well as improve the management and treatment of patients with cancer.

4. The study of the *diagnosis of cancer,* which may be divided into the improvement of existent methods, such as by roentgen examination and exfoliative cytology, and the introduction of new methods, depending on the clinical trial of information derived from the study of the cancer cell and cancer-host relationships.

5. The study of the *therapy of cancer,* which also may be divided into the improvement of existent methods of surgical and radiological treatment, and the laboratory and clinical trials of new chemical and physical agents. A thorough understanding of the natural course of the disease, and continual observation and follow-up of patients are implied in these investigations.

The University of California is conducting investigations in all these five segments of the cancer problem. Thirty-four separate research projects were being carried out in 1947, and this number increased to 69 during 1949. There is a natural division of effort depending upon the scientific disciplines applied to the problem. Research on clinical aspects is concentrated in the two schools of medicine. Investigations of the basic biological, chemical and physical phases of cancer gravitate to the appropriate academic divisions on the Berkeley and Los Angeles campuses. Agencies of the university concerned with cancer research also conduct research in other aspects of their respective scientific disciplines. Often the dividing line between such work and cancer research is a narrow and arbitrary one.

There are several large areas or groups of workers with the exclusive or chief aim directed toward research on cancer. These include the Cancer Research Institute, the Laboratory of Experimental Oncology and the Cytological Laboratory in San Francisco; the Donner Laboratory of the Division of Medical Physics, the Division of Biochemistry, and the Cancer Research Genetics Laboratory in Berkeley; and the Institute for Cancer Research on the Los Angeles campus. Other departments with extensive programs in cancer include the department of zoology in Berkeley, the divisions of pathology, obstetrics and gynecology, surgery, radiology and biophysics in the medical schools in San Francisco and Los Angeles, and the departments of biochemistry and zoology in Los Angeles.

The research activities of the School of Medicine in San Francisco are concerned mainly with the diagnosis, pathology, therapy and statistical evaluations of patients with cancer. These studies not only provide the essential foundation for other clinical research in cancer but in themselves are important contributions to the knowledge regarding the natural history and the effect of diagnostic and therapeutic measures on the progress of the disease.

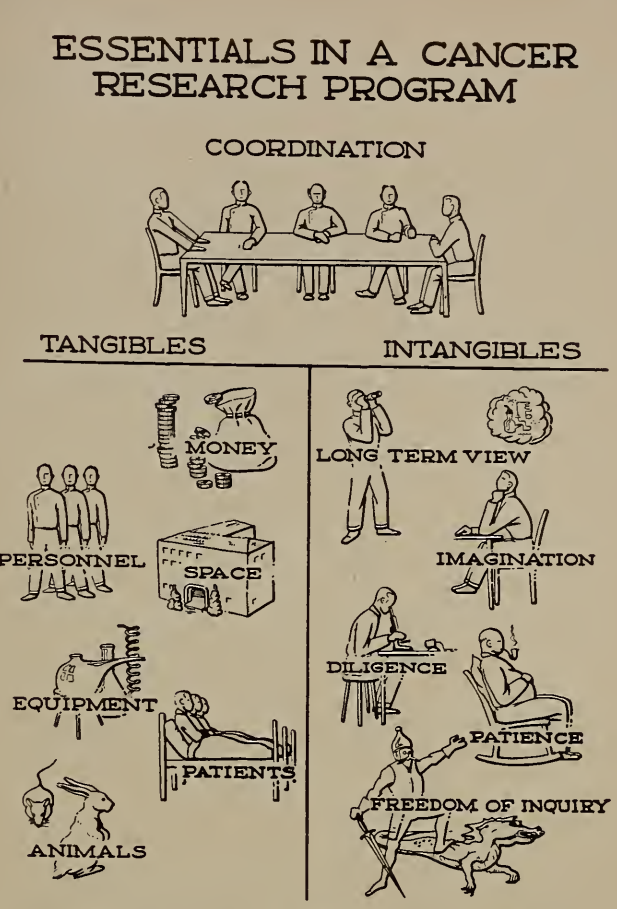

Figure 3.—Essentials in a cancer research program.

The Laboratory of Experimental Oncology has clinical research for its primary objective. The program is oriented toward the study of the physiology and biochemistry of the patients and how such changes are correlated with the clinical manifestations of the disease. Experimental chemotherapy, with emphasis on the mode of action of chemical agents, is an important phase of the efforts. At the same time, human neoplastic tissue is being studied and compared with normal tissues by physiochemical and immunochemical techniques.

The Cytological Laboratory is extending the application of exfoliative cytological techniques in the diagnosis of cancer. Detailed investigations and further elaborations of the method are being conducted on vaginal smears, aspirations from the nasopharynx, lung, bladder and stomach. This important area is of immediate impact not only on research but on clinical diagnosis, teaching, and services to the physicians of the state.

The program of the Donner Laboratory is concerned with three broad phases. The first is the study of metabolic processes of normal and cancer-bearing animals and tissues by means of substances into which radioactive materials have been incorporated. The second area attempts to obtain selective irradiation and destruction of cancer tissue by introducing radioactive elements into compounds that go selectively to specific tissues. The third field of investigation involves the study of effects of

radiation upon biologic material, with special reference to the effects of various products of atomic fission.

The Division of Biochemistry in Berkeley accentuates the study of biochemistry of normal and cancer tissue with special attention to protein metabolism, the structure of proteins in tissues, and the role of proteins in growth and tissue differentiation. Analogues of amino acids and related compounds are being explored for their possible retardative effects on cancer growth.

The program on the Los Angeles campus is being rapidly developed. The several departments of the School of Medicine within the framework of the new Institute for Cancer Research are conducting investigations on biochemical diagnostic tests in cancer, with special reference to antiproteolytic substances in the blood, and the possible presence of abnormal lipid, sterol, hormonal and other materials in the urine and blood of cancer patients. The department of chemistry and the department of zoology are investigating biochemical alterations in cancer tissue, and the relation of amino acids and hormones to the production and growth of cancer.

The growth and development of the cancer research program of the University of California can be gauged to some extent by the number of publications issuing from its investigators. In 1948, 28 separate reports from the university appeared in the scientific literature, while approximately 20 additional papers were in press. In 1949, 105 separate contributions to the scientific literature were published, and approximately 30 additional ones are in the process of publication.

Progress in cancer research throughout the world is so unmistakable that high optimism toward the eventual solution of the cancer problem is well justified. The developments at the University of California during the past three years have established the University of California as an important segment of the national effort toward the solution of the cancer problem. With proper tools and continued support, with imagination and patience both in the scientific and administrative aspects of the problem, the University of California can stand in the forefront of these inevitable achievements.

The Medical Center.

BOOK REVIEWS

CAUSE FOR CRUSADERS—A Hospital Fact Book. Prepared by the Council on Public Education, Association of California Hospitals, 26 O'Farrell Street, San Francisco 8, 1950.

The stated purpose of this pamphlet is to inform the public concerning "The truth about hospitals." The pamphlet achieves part of its purpose very well. The sections dealing with operating costs, health insurance and such matters contain largely factual information. The author must be commended on these portions, despite the fact that the casual reader would gain the impression that 100 per cent of the credit for modern scientific diagnostic procedures and for the improved health of the American public is solely due to hospitals.

There are other portions of the pamphlet which must give the thoughtful physician serious pause. On page 1, it is stated that,

> "At first all of our hospitals were voluntary, charitable institutions. Gradually they evolved into scientific centers for diagnosis and treatment."

Readers of the *Woman's Home Companion* for April 1950 will find a contrary statement by Albert Deutsch:

> "To a shocking extent hospital administrators tend to operate their laboratories as sources of profit to subsidize other hospital activities. They are maintained on the skimpiest of budgets, understaffed and have insufficient modern equipment. In many hospitals the laboratory pathologists must depend mainly on interns and residents for help. . . ."

On page 2, the author states that the purposes of the modern hospital are:

> "To alleviate suffering, to seek the cause and cure of disease, to preserve and restore health, to educate those who would serve humanity in the medical sciences. Such is the tradition of your community hospital."

It seems to your reviewer that the purposes of the modern hospital are to provide a bed wherein sick or injured individuals may lie when they cannot be taken care of at home. *All of the other claimed purposes are functions of the medical profession.* If the average community hospital and the average non-profit hospital would stop trying to be a university clinic, a research center and a reflection of Hollywood's idea of an ivory tower, the cost of hospital beds would drop and the public would benefit.

The author stresses the increasing number of therapeutic techniques requiring equipment "available only at hospitals." The House of Delegates of the C.M.A. recently handled this canard in adopting unanimously the resolutions from physicians in Alameda and Santa Clara counties dealing with (a) the new C.P.S. "medical care while hospitalized contract," and (b) the resolution on hospital coercion of physicians in regard to sending out-patients for drugs, special tests, etc. The fact of the matter is that 95 per cent of the special diagnostic and therapeutic procedures required in modern scientific medical care can and *are* being provided by physicians in private practice in their private offices, departments and clinics. The hospital has merely attempted to invade some of these fields either as a result of need for additional funds or from a power complex on the part of a few administrators.

The pamphlet states that there are 385 licensed general hospitals in California according to the State Department of Public Health (32,810 beds) which include 136 non-profit hospitals (bed capacity 16,148) according to A.M.A. registration. It also lists the vast number of federal, state and other governmental hospitals and beds, which outnumber the above over three to one.

On page 32, the question is posed, "What are the functions of a hospital?"; followed by this answer:

> "To give bedside care to the ill and injured; to provide training for professional personnel; to provide facilities for scientific research. More recently programs for preventive medicine, *home care*, and rehabilitation have been developed *as functions of the hospital.*"

Your reviewer suggests that this is an additional indication of the serious trend for hospital domination of medicine and medical practice both in and outside the institution. He trusts that the next edition of the book will be prepared in collaboration with a committee of the organized medical profession in California, the profession which converts a building with four walls, a roof and some beds into an institution wherein the sick and injured may be treated and cured.

* * *

CLINICAL ORTHOPTIC PROCEDURE — A Reference Book on Clinical Methods of Orthoptics. By William Smith, O.D., Associate Professor in Optometry and Instructor of Orthoptics, Massachusetts School of Optometry, Boston, Mass. The C. V. Mosby Company, St. Louis, 1950. $8.00.

The author is associate instructor in optometry and instructor of orthoptics and visual training at the Massachusetts School of Optometry. The book attempts to "present a system of simple orderly procedures for testing and treating functional anomalies of the binocular apparatus." There are no separate chapters on anatomy, physiology, visual psychology and ocular mechanics, it being rightly assumed that anyone interested in the practice of orthoptics should be familiar with fundamentals.

The book is easily readable and contains excellent illustrations of the various instruments used in orthoptics. The diagrams on the whole, however, are rather poor and in some instances as on page 35 the muscles are mixed up. There are numerous errors in the book such as the one on page 251 where the author states that limitation of down-and-out movement of the affected eye is one of the important signs of superior oblique palsy.

The author takes great delight in stating that cycloplegia prevents accurate diagnosis and believes that surgery is only valuable in a small percentage of squints. There are a tremendous number of cases presented, all of which end in complete cures.

A less prejudiced viewpoint, together with the avoidance of the many errors, combined with the author's ability to write a very readable book, might have resulted in an extremely valuable book on the subject. As it is, the book cannot be recommended for ophthalmologists or technicians because of the errors that are easily discoverable.

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THE PATHOLOGY OF ARTICULAR AND SPINAL DISEASES. By Douglas H. Collins, O.B.E., M.D. (Liverp.), Reader in Clinical Pathology in the University of Leeds. The Williams and Wilkins Company, Baltimore, 1950. $7.00. 331 pages.

Most standard textbooks of pathology are limited in the amount of space given to the diseases of the bones and joints. Usually there is an adequate discussion of the tumors of bone in such standard texts, but the physician has much more occasion to deal with the diseases than with the tumors of the joints and the bones. Dr. Collins has for 15 years col-

lected specimens illustrating the various stages in the pathology of the articulating surfaces of the bones and in the bone structure itself. He has presented the result of this intensive study in this small volume. Perhaps the average physician does not care to delve into the fine points of diagnosis and classification of these rheumatic diseases, but if he does he will find in Dr. Collins' work the best short discussion of the subject.

Aside from clinical evaluation of a patient's condition there are three methods available to the physician for pinpointing the diagnosis, i.e., biochemical analysis, radiographic examination, and histological examination of biopsy material. No single approach will completely satisfy the requirements for correct diagnosis. The author has so arranged his material that the physician reading the radiologic interpretation of the joint films can then find a short concise discussion of the pathological process involved. He also gives the necessary chemical deviations for each disease. When necessary he uses simple diagrams to describe the course of the disease process and then illustrates with excellent photomicrographs the histopathology, and with occasional radiographs and photographs of the gross specimens he gives a complete picture. It is to his credit that he also emphasizes that more than one disease process can be present in a joint concurrently. This concept is important from the standpoint of treatment as well as classification and is perhaps too little emphasized.

Although it is not the purpose of this study to present a detailed discussion of the tumors of bone, there is a chapter which outlines the subject in such a fashion that with the aid of the bibliography the physician should be able to expand readily as the need might arise any particular section of the discussion. In general, the bibliographies are well chosen for each of the 17 chapters. The first three chapters deal with general anatomy and embryology, histology and physiology, and a short review of bone diseases. There is a short chapter on the relation of trauma to joint disease. In addition to the chapters on gout, osteoarthritis, and rheumatoid arthritis there is a good chapter on disorders of the joints in diseases primarily affecting other systems. This chapter includes discussion of atrophy and contractures, rickets, scurvy, purpura, hemophilia, endocrine disorders, syphilis, yaws, leukemia, and hypertrophic (pulmonary) osteoarthropathy. The inclusion of such a chapter makes the book more valuable as a reference source.

In reading this book one is struck with two concepts, i.e., that the joint diseases involving the peripheral joints and the joints of the spine should be treated separately, and that there are many more reasons for diseases of joints than just rheumatoid and osteoarthritis. There is an excellent chapter on rheumatoid arthritis from the standpoint of etiology in which the relation between rheumatoid arthritis and rheumatic fever, the relation between rheumatoid arthritis and osteoarthritis, the relation between rheumatoid arthritis and peripheral vascular disease, comparative pathology and experimental arthritis (in farm animals, rabbits, rats, and mice) and endocrine factors are discussed. For the rheumatologist, the radiologist, and the orthopedic surgeon this book constitutes important required reading. For other physicians and for medical students it should prove interesting and informative.

* * *

SAW-GE-MAH (MEDICINE MAN). By Louis J. Gariepy, M.D., Northland Press, St. Paul, Minnesota, 1950. $3.00.

Your reviewer enjoyed this book very much. Not only was it an interesting novel dealing with the progress of a boy of humble origin up through pharmacy, general practice and a specialty, but it also had woven into it many of the author's ideas in regard to the present-day social, economic and public relation problems of medicine.

He does this by emphasizing the importance of the general practitioner in the world of medicine, and the necessity for building good private physician-patient relationship (upon which all public relations rest) by means of competence, kindness, hard work, personal attention and fair fees.

Excellent reading for both physician and layman.

* * *

PENICILLIN—ITS PRACTICAL APPLICATION. Under the General Editorship of Professor Sir Alexander Fleming, M.B., B.S., F.R.C.P., F.R.S. Second Edition. The C. V. Mosby Company, St. Louis, 1950. $7.00.

One welcomes the second edition of Sir Alexander Fleming's book on penicillin, which is certain to present an authoritative discussion on the subject. In this edition Sir Alexander has called on numerous colleagues to write various chapters and the applications of this important antibiotic in every field are fully exposed. Penicillin is now so well known that its use has become pretty well standardized so one does not find a great deal that is new, but as a definitive reference book this treatise is certainly outstanding.

* * *

NAVAJOS, GODS AND TOM-TOMS. By S. H. Babington, M.D., F.I.C.S. Greenberg, Publisher, 201 East 57th Street, New York 22, 1950. $3.50.

A pleasant, worthwhile story of the author's travels in the Navajo Indian country while serving as physician to the Ansel Hall archeological expeditions.

The general reader will be interested in Dr. Babington's description of the remote, rugged but beautiful country, the scenery, the flora and fauna, the archeology and the old cliff dwellings. Physicians will enjoy his studies of the health of the primitive people, their sanitation or the lack of it and the methods of their medicine men. There are some very good details of these medicine men in action which the author was privileged to observe. Their treatment of the sick by means of chanting, incantations and by painting of symbolic pictures in the sand is psychosomatic medicine in its aboriginal form.

* * *

BREAST DEFORMITIES AND THEIR REPAIR. By Jacques W. Maliniac, M.D., Clinical Professor of Plastic Reparative Surgery, New York Polyclinic Medical School and Hospital. Grune and Stratton, New York, 1950. $10.00.

Mammaplasty has until recently been accepted by the general surgeon with considerable indifference. This has been due to a lack of appreciation of the patient's predicament, and perhaps more often due to a lack of knowledge of the proper operative techniques. In Maliniac's book, "Breast Deformities and Their Repair," the purpose is primarily that of showing the general surgeon, who has no special experience in the field, which are the safe procedures for correction of breast deformities. The book is composed of 11 chapters with 119 illustrations. It is well written and the illustrations are numerous and good. Operative procedures are well described and an extensive bibliography is given. One is impressed that the author has gone to considerable thought and effort in writing this book in a concise and yet thorough manner. The average surgical textbook does not cover this subject sufficiently for the general surgeon who is considering doing mammaplasty. This book does so very satisfactorily and it can be recommended to the general surgeon who may desire to become interested in mammaplasty.

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The Prevention of the Fluid-Electrolyte "Problem" by Simple Means

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SUMMARY

Proper fluid balance may be maintained in patients after operation by the employment of simple, inexpensive procedures which may be carried out even in the smallest hospitals.

Daily weighing of patients, measurement of fluid intake and output, and knowledge of the probable electrolyte content of fluid losses are adequate guides for replacement of fluids and electrolytes. An increase in body weight is a warning of overhydration.

The content of the solution used for replacement is dictated by the route of fluid output—whether from the gastrointestinal tract, the skin, or the kidneys. Insensible losses (by perspiration and respiration) are fairly static.

Except to replace extrarenal losses, parenteral administration of normal saline solution in the immediate postoperative period is contraindicated.

Mistakes in replacement methods, especially those causing overhydration, are particularly hazardous for elderly patients.

PREOPERATIVE and postoperative management of the surgical patient has become equal in importance to surgical technique itself. The surgeon is called upon daily to apply principles of fluid and electrolyte replacement for optimum care of patients. Yet, if he reviews the current literature concerning electrolyte and fluid problems, he meets a confusing array of sodium, potassium, chloride, and carbon dioxide concentrations expressed as mill-equivalents, millimols or volumes per cent, and the everyday business of keeping a patient in balance appears a highly technical procedure. With the development of parenteral solutions of a myriad of chemical combinations, and with the accumulation of confusing experimental data involving their uses, the problem of routine maintenance seems to have become exceedingly complex. Too much emphasis is placed on how to treat patients as "fluid and electrolyte problems." It is time that emphasis be placed where it belongs, namely, on how to maintain patients properly and thus keep them from becoming problems.

The purpose of this discussion is to clarify the working principles of replacement so that they may be applied with ease and understanding. This is not to be accomplished by oversimplification, but by the application of fundamental physiological observations repeatedly verified in the clinical laboratory.

The term replacement is self-explanatory. The usual patient is in balanced state at the time of operation. Maintenance of this state throughout the postoperative course is the ideal. Until the patient is able to ingest all that is needed to maintain the balance, replacement rests in the hands of the surgeon. It can be accurately controlled by carrying out the simplest of measures. The basic requirements are a reliable set of weighing scales, an observing nurse with a measuring bottle, and an understanding by the surgeon of simple replacement principles.

The primary working guides for the surgeon are the determination of body weight, the measurement

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of fluid intake and output, and the estimation of the electrolyte losses from the skin and lungs, the gastrointestinal tract and the kidneys. The simplest of these three, *daily measurement of the body weight,* is the most important, because day-to-day changes in body weight represent gains or losses in the total water content of the body. As some 70 per cent of body weight is water, when the more or less static weight of the skeleton is considered it becomes apparent that between 70 and 80 per cent of the easily shiftable weight is water. The weight of one liter is 2.2 pounds. However, for the purposes of fluid balance a round figure of 2 pounds per liter suffices. Thus, an increase of 4 pounds in weight from one day to the next indicates that 2 liters of waters has been added to the total water content of the body.

Wangensteen,[6] in calling attention to the value of determining weight changes in controlling hydration, advocated daily postoperative weighing and placed the emphasis on anticipating and protecting against dehydration. He recognized that the effects of dehydration are not observable clinically until at least 6 per cent of the body weight is lost. However, in the author's experience the opposite situation is more to be feared — namely, the insidious accumulation of fluid, leading to deposit of water at the lung bases, perhaps with hypostatic pneumonia long before edema becomes obvious. Bladder irrigation, often necessary during the first 48 hours following urological operations, makes accurate determination of output extremely difficult. In such circumstances, oliguria or anuria may not be immediately detected when it occurs; parenterally administered fluids, especially if containing salt, are retained and a stormy postoperative course ensues. In such instances, body weight determination on the first postoperative morning would show a gain and indicate immediate evaluation of the patient's renal function. (In the presence of anuria or oliguria daily weight measurement is the great life saver, protecting against overhydration during the two weeks of recovery—the period required for repair of reversible acute renal lesions.)

A second primary function of the daily determination of weight is to permit estimation of fluid losses that cannot be measured, such as the losses in sweat or in vomitus that has missed the volumetric flask. Losses by both of these avenues are of the greatest importance not only because they result in fluid deficit but also because electrolytes in these secretions are lost as well, and body electrolyte stores hence may become rapidly depleted. Accurate estimation of such losses is quickly obtainable at the bedside by noting a fall in weight greater than that estimated from the intake-output record. This estimate of fluid loss can be exceptionally accurate when the patient's entire intake has been given parenterally in measured amounts and the urine output is known.

With early ambulation, nine out of ten patients may be placed directly on the scales at the bedside. The occasional patient who is too weak to stand or who should not be moved can be accurately weighed as demonstrated in Figure 1. The weighing litter, made to fit the platform of the scales, is constructed of plywood at a cost of a few dollars, and is light enough to be handled by an attendant. A canvas stretcher with poles removed is placed beneath the patient by the same technique that is used in changing bed sheets. The poles, shortened to fit within the bed-ends, are then placed in position and the patient lifted from bed to scales. The entire procedure requires only a few minutes and the help of two attendants or house officers.

Measurement of intake and output is next in importance. This is available to surgeons in every hospital, and accuracy is dependent entirely upon the conscientiousness of nurse and house officer. It has been the author's experience that a nurse who has been informed of the importance of this measurement becomes a cooperative aide. In making measurements of output, the route of loss—whether by urination, vomiting, gastrointestinal suction, biliary T-tube drainage, or diarrhea — should be recorded. Even if the intake and output measurements are in serious error, it is possible to carry out fairly accurate fluid and electrolyte replacement on the basis of body weight changes alone, provided the route of loss is known. The intake-output record and the determination of body weight thus act as a check-and-balance system workable in any hospital or even in the patient's home.

The third factor in replacement is a general knowledge on the physician's part of the channels of fluid and electrolyte loss. The accompanying chart (Figure 2) diagrammatically presents the working principles of fluid replacement in relation to route of loss. The majority of replacement solutions shown in the chart are usually in stock in a hospital supply-room. If the exact solution needed is not already made up and on hand in sterile containers (such as the solution containing 6 gm. of sodium chloride per liter) then two or more solutions which together will provide the proper amount and content of replacement fluid may be given consecutively. For example: When 3 liters of gastrointestinal content is lost, replacement may be made with 2 liters of normal saline or Ringer's solution, each liter of which contains 9 gm. of salt, and 1 liter of dextrose in water. The effective replacement, then, is 3 liters with 6 gm. of salt per liter.

To begin above and work down (Figure 2): Insensible losses are pictured as thin wavy lines, and only water is required as replacement. Daily losses by this route are remarkably constant at 500 to 800 cc., two-thirds coming from the lungs. The quantity of electrolyte present, namely salt, in the fluid thus lost is negligible from the standpoint of replacement; it amounts to less than 1 gm. per day and replacement is not necessary.

Observable sweat is pictured in the droplet form seen on the brow on humid summer days and with fever. During athletic contests, weight losses of six to eight pounds are common. Such losses are made up of 3 to 4 liters of sweat that is definitely salty.

The actual salt concentration in sweat varies greatly, ranging from 2 gm. to as much as 8 gm. per liter with an average value of somewhere between 3.5 and 4.5 gm.[3] Loss by this route may be the main cause of serious salt deficiency during prolonged shock and febrile states. (One patient who was observed recently lost eight to ten pounds during prolonged fever and shock. This weight loss represented a deficit of 4 to 5 liters of fluid with an estimated salt concentration of 4.5 gm. per liter. The clinical state of the patient did not improve until this electrolyte was replaced along with the water.) When there is visible sweat, daily losses by that route must be expected to be at least 500 cc. (in addition to insensible losses of about 800 cc.) and may be much larger. Adequate replacement with solutions at present available requires the use of half-normal saline solution, which contains 4.5 gm. of salt per liter. Here again a determination of the changes in body weight, plus a knowledge of probable salt losses in sweat, provides a basis for estimating the amount and content of solution needed for replacement.

Gastrointestinal losses of salt and water, whether by vomitus, by Wangensteen suction, by T-tube drainage, or by diarrhea, may be adequately replaced with solutions containing 6 gm. of salt per liter. With intestinal obstruction of any grade, combination of the gastric and intestinal secretions takes place so that the effective losses of the chloride and sodium ions average out as salt at 6 gm.

Photograph by courtesy of [illegible] ital

Figure 1.—The patient who is too sick to stand on the scales is weighed by means of a plywood cradle which fits on the platform of the usual hospital scales. He is transferred to and from the scales on a stretcher, the poles of which are removable and shortened to fit within the bed-ends.

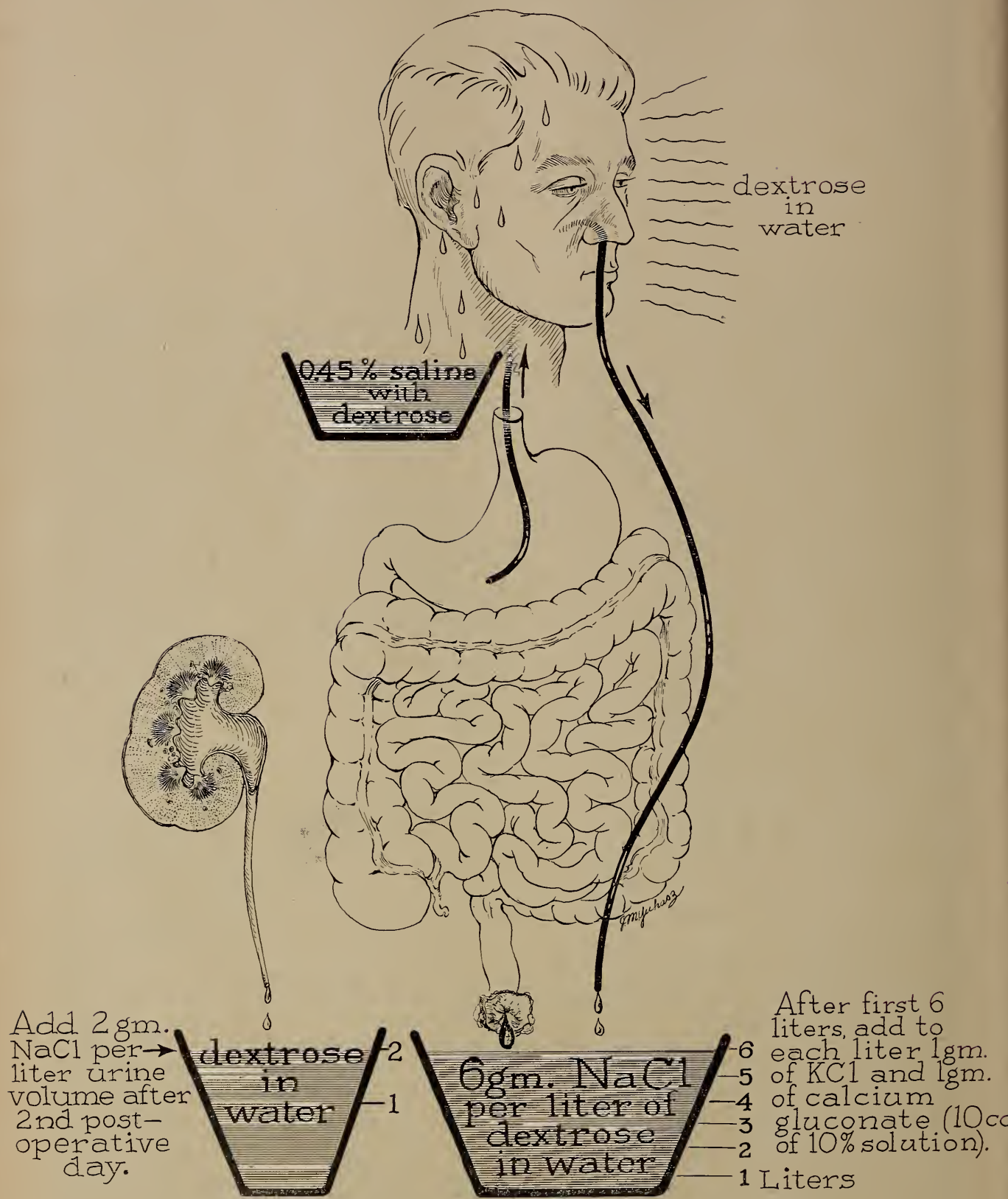

Figure 2.—Replacement requirements in terms of solutions and routes of loss.

per liter. If the usual normal saline solution (9 gm. per liter) is used for replacement, it must be administered in conjunction with dextrose in water to provide the necessary 6 gm. per liter relationship. This also holds true for Ringer's solution, which contains 9 gm. of salt per liter as well as small amounts of calcium and potassium. If losses continue for only a few days, the author uses Ringer's solution, taking advantake of the minute amounts of calcium and potassium present, which, although considerably short of actual losses of these ions, help somewhat in replacement. Quantitative replacement of gastrointestinal losses at the time of loss is mandatory.

The remaining ion of proven importance in replacement therapy is potassium. The literature has been enriched recently by much data on the use of potassium. The reports have stressed the need for adequate replacement of potassium, and at the same time have warned of dangers from its use. Unfortunately, the warning seems to have been heeded more than the need, so that the over-all result appears to be a tendency to avoid the use of potassium. Potassium is present in an average concentration of 0.5 gm. per liter in gastrointestinal secretions lost as vomitus or removed by suction. In fluid lost by diarrhea, the potassium concentration is closer to 1 gm. per liter. The great majority of patients with cellular stores of potassium of 160 gm. or more tolerate short-term losses very well. However, when these losses approach 20 per cent (20 to 30 gm.) of body stores, signs of deficit appear. This most commonly occurs with prolonged gastrointestinal suction or diarrhea during which losses have been replaced by solutions containing only ions of sodium and chloride. The vital point is that the kidney cannot conserve potassium during periods of deficiency as it is able to do with sodium and chloride. Thus, while the patient is losing 0.5 gm. of potassium in each liter removed from the bowel, he is simultaneously losing at least another 0.5 gm. in each liter of urine, despite already decreased body stores. Following trauma, shock and dehydration, urinary potassium losses tend to be 1 gm. or more per liter in spite of deficit. When large amounts of dextrose and water are given to create a large volume of urine, these potassium losses are of course accentuated. The potassium deficit may be serious and may cause a variety of mysterious symptoms long before warning of danger is given by decreased potassium concentration in the plasma. Therefore, if there is pronounced loss of gastrointestinal contents, potassium as well as sodium and chloride is required for replacement.

The intravenous use of potassium is complicated by the knowledge that high potassium levels in the plasma may cause cardiac irregularities and even cardiac arrest. The rate of injection of potassium must therefore be limited, at least until such time as extensive clinical data indicate more aggressive use of it. This is especially true if the rate of flow of the replacement fluid into the vein cannot be constantly watched. The author, therefore, follows this rule: For the first 6 liters of electrolytes and fluid removed from an adult, replace only the sodium and chloride ions. The great majority of patients do not require intubation for a longer period, and the ordinary diet quickly replaces potassium losses. But if more than 6 liters is removed and replaced with sodium chloride in dextrose, and it still appears that suction will have to be continued for an extended period, 1 gm. of potassium chloride is added to each liter of replacement solutions. (One gm. of potassium chloride supplies 0.5 gm. of potassium, so that the effective potassium replacement is 0.5 gm. per liter.) This may be mixed directly from the autoclaved dry form or added to each liter from a 10 per cent sterile solution. In order to replace calcium losses, as well as to balance the effects of the increased potassium ion during injection, 10 cc. of a 10 per cent calcium gluconate solution is also added to each liter. This procedure safely accomplishes potassium replacement of gastrointestinal losses at the time of loss.

The final and least generally understood loss which requires replacement is that from the kidney. Urine volume of 1,200 cc. daily in the early postoperative period is entirely adequate. When the patient is no longer maintained on fluid given parenterally, his oral intake may freely increase the urine output. The question of necessity for replacement of "salt losses" in the urine then arises. That the normal or moderately damaged kidney is obliged to excrete salt is a common misconception. Coller,[2] Abbott,[1] and others[4] have repeatedly demonstrated that the patient who has been operated upon tends to retain not only the body stores of salt but also any additionally administered salt and water during the first 24 to 48 postoperative hours. Each 6 gm. of salt given following operation tends to retain 1,000 cc. of water in the tissues. Because of this fluid and salt retention, with what amounts to overreplacement of the sodium and chloride ions, urine output tends to be less than in the patient receiving the same amount of fluid as dextrose in water. Perara[5] has further shown that the elderly hypertensive patient tends to retain sodium chloride and is able to remain on a relatively salt-free diet for months to years. This implies that with vascular changes of aging but with normal kidney function as measured by phenolsulfonephthalein excretion and by nitrogen content of the plasma, the tendency to retain the sodium ion is increased. Since the elderly patient may be adversely affected if overhydration occurs, especially during the early postoperative period, the routine use of normal saline parenterally at this time, unless specifically needed for replacement of extrarenal salt losses, is to be condemned. (The author observed one elderly man in whom gross edema developed insidiously during a 12-day period because of routine use of 1 liter of normal saline solution daily. A postoperative weight chart—he had gained 14 pounds—would have called attention to the fluid retention in time.) When parenteral replacement is necessary beyond the second postoperative day, the author provides sodium chlo-

ride in amount sufficient to permit excretion of 2 gm. per liter of urine. Thus, with the urinary output ranging around 2 liters, the daily intake of salt parenterally is restricted to 4.5 gm., usually given as a liter of half-normal saline solution in dextrose or as 500 cc. of normal saline solution.

Replacement of blood lost during or after operation requires only brief discussion. Optimum care demands replacement of whole blood at the time whole blood is lost. When the weighing of sponges or other means of measurement of blood loss cannot be carried out, the judgment of the surgeon must suffice. Care must be taken not to give too much blood. Abnormally high blood volume is as much to be feared as is retention of fluid; it may lead to cardiac failure. Red cell mass alone may be used to replace blood lost postoperatively, save in the case of acute hemorrhage. An elderly patient, even one in only fair nutritional state, will recoup plasma losses from body stores and from diet within the 24 hours after operation if hydration is maintained.

Special attention should be called to the differences between elderly patients and younger ones with regard to replacement of fluids parenterally. Primarily, the older patient has less capacity to tolerate mistakes in replacement, especially those connected with the routine and overenthusiastic administration of salt and water. With salt retention in the early postoperative period, fluid is more liable to collect at the site of operation and in the easily distensible tissues. A little fluid at the lung bases may lead to hypostatic pneumonia; visceral edema may lead to nausea and dietary problems; increase in plasma volume may cause cardiac decompensation. In addition, trauma and shock are considerably more liable to result in kidney damage in elderly than in young patients. Oliguria associated with rising nitrogen levels in the blood following operation is far more common in elderly patients than is generally recognized. Anuria of the lower nephron type must always be anticipated following a period of shock, especially in the older patient. With routine parenteral administration of 3,000 cc. of fluid per day, signs of fluid retention are certain to develop. Measurement of body weight and conservative hydration will protect the patient in such circumstances.

DISCUSSION

On the basis of the data presented, the postoperative fluid demands of the average patient are met with 2,000 cc., which allows 800 cc. for insensible perspiration and 1,200 cc. for urine production. The great majority of patients are taking food by mouth on the third day, and parenteral fluid administration then is no longer necessary. Losses in formed feces are disregarded, as they are counterbalanced in the main by water produced from the combustion of fat, carbohydrate, and protein. The only indication for the use of salt solutions during the first 48 postoperative hours is for replacement of extrarenal losses, and that replacement must be prompt and quantitative. Plasma electrolyte determination by laboratory tests is rarely necessary unless day-to-day replacement has been neglected.

CONCLUSIONS

Adequate replacement of fluid and electrolytes requires the use of simple and easily available measures. They are measurement of body weight, measurement of intake-output, and knowledge of probable electrolyte content of fluid losses.

Adequate replacement solutions are:

—for insensible losses—dextrose in water.

—for gastrointestinal losses — 6 gm. of sodium chloride per liter of water to replace the first 6 liters of fluid lost. Following this, 1 gm. of potassium chloride plus 1 gm. of calcium gluconate (10 cc. of 10 per cent solution) is added to each liter.

—for observable perspiration—half-normal saline solution.

—for urine excretion—dextrose in water for 48 postoperative hours. With urine volume of 2 liters and adequate kidney function, 1 liter of half-normal saline daily thereafter, in addition to dextrose in water.

Use of normal saline solution parenterally in the early postoperative period is contraindicated in the absence of extrarenal salt losses.

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Considerations of Postoperative Electrolyte and Fluid Replacement

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SUMMARY

The most important postoperative fluid considerations are maintenance of adequate urinary output, of blood volume, and of extracellular and interstitial cell water and electrolytes.

Normal urinary output is between 1,000 and 1,500 cc. daily. A fluid intake of 2,000 cc. of 5 per cent dextrose in distilled water, plus 500 cc. of normal saline solution, will insure this amount of urinary output.

The use of 5 per cent dextrose solutions in distilled water provides fluid, retards the protein catabolism of the body, and spares electrolytes.

Irradiated plasma is the only intravenous solution which will adequately supply protein in amounts to maintain nitrogen equilibrium. Protein hydrolysates in the absence of adequate caloric intake do not provide enough protein for nitrogen balance.

The role of the potassium ion is ordinarily not a consideration in postoperative fluid management. It becomes a consideration in the presence of a large amount of drainage from wounds or abscess cavities, nasogastric suction, or intestinal fistulae. It also must be given attention in cases in which parenteral administration of fluids is necessary for a prolonged period.

FORTUNATELY, ideas of postoperative fluid management have undergone considerable change in the past few years. The experimental approach to such problems and experience in dealing with them have changed, for the better, the indications for the use of various fluids postoperatively. Patients should be prepared for operation with normal hydration, blood volume, hemoglobin concentration, electrolyte and nitrogen equilibrium and with normal renal function. Postoperative fluid therapy is greatly complicated if preoperative deficits must be dealt with simultaneously with postoperative fluid requirements.

In general, surgical procedures interrupt the normal body functions by affecting blood volume, hemoglobin concentration, plasma proteins and electrolyte concentrations. And, in general, postoperative care is directed toward replacing the abnormal fluid losses which may be incurred during the operation or which may follow in the postoperative period from vomiting or mechanical withdrawals from the gastrointestinal tract, from abnormal losses through fistulae in the intestinal or urinary tract, from excessive tissue and fluid drainages, or from subsequent alterations in fluid adjustments attendant upon these changes.

Fluid and electrolyte replacement is based upon considerations of several anatomical and physiological factors. First, the extracellular fluid compartment. This compartment is recognized as that space or potential space in which electrolyte ions and protein molecules interchange between vascular capillaries and tissue cells. The fluid in the compartment is made up of plasma and interstitial fluid. The interstitial fluid may move into the general circulation to maintain plasma volume following shock from blood loss, or it may increase greatly due to upsets of electrolyte equilibrium or of osmotic pressure and be manifested as edema. Second, normal renal function must exist for the proper removal of the products of metabolism and for the delicate adjustment of acid-base balance. Third, losses of protein, water, and electrolytes must be measured accurately if replacement is to be accurate. Fourth, caloric requirements of the individual must be understood in order that the need for replacements may be computed.

The goal in postoperative fluid therapy is to maintain normal renal function and to prevent upsets of electrolyte balance which may produce alkalosis or acidosis. Of secondary importance is to restore by parenteral means caloric requirements or the protein losses attendant upon the surgical procedure or upon the disease which necessitated operation. The patient whose gastrointestinal tract can receive fluids and who loses electrolyte only through renal filtration and who has no protein loss from wound drainage or fistulae of various kinds, is not a difficult problem. But loss of these substances, through hemorrhage, vomiting, diarrhea, fistulae, or purulent drainage, increases the difficulty of replacement.

Maintenance of renal function is one of the first postoperative considerations. Closely associated with satisfactory renal function is the ability of the kidney to excrete or conserve sodium. It is a frequently observed fact that during the 24 hours following following major surgical procedures, there is a temporary decrease in urinary output, no matter how much parenteral fluid is added to the circulation. During this same period less sodium chlo-

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ride is excreted by the kidneys. Fluids in excess of blood volume requirements will therefore be held in the interstitial fluid compartment, and the salt not excreted by the kidney will also find its way into this compartment. This in turn will attract more fluid in the extracellular space in response to osmotic changes incident to increased ionic concentrations. Therefore, in the immediate postoperative period, fluid should not be in excess of that needed to replace body water stores, and such fluids as are given should be low in salt content.

Adequate urinary output is approximately 1,000 to 1,500 cc. daily. An intake of 2,500 cc. of fluid in 24 hours will provide for a urinary output of this amount, if the patient has no abnormal fluid loss. The normal daily salt requirement is between 4 and 5 gm. (18 to 36 gm. of sodium chloride was administered almost routinely 12 to 15 years ago). Rather careful studies of the concentrations of sodium chloride in the urine recently have been made in normal individuals maintained on fluids given parenterally.[2,3] These studies showed that sodium chloride administered in excess of 4 to 5 gm. daily will appear in the urine. When renal function is impaired, excesses of sodium and chloride will be held in the interstitial fluid with the previously mentioned effects. Five per cent dextrose in distilled water is an isotonic solution; 2,000 cc. of this solution plus 500 cc. of normal saline solution daily will provide necessary hydration and satisfy normal salt needs.

Abnormal fluid loss through gastric suction, biliary drainage, or fistulae, must accurately be measured and the amount added to the figure of 2,500 cc. in order to hydrate the patient adequately. The amount of electrolytes lost through these abnormal means should be calculated and replaced by intravenous injection of a solution containing them, or by adding needed ions to a solution for intravenous use.

The principal intracellular electrolyte is potassium. This electrolyte commonly is excreted in the urine in small amounts at a steady rate, and the excretion rate continues if no potassium is supplied to the body. Such losses can be sustained by the body for seven to 10 days without any replacement. Potassium excretion is tied up with the protein metabolism. Excessive potassium loss should be borne in mind in dealing with large protein losses such as occur in patients who have extensive abscesses or severe burns. Potassium losses also are greater than normal in patients who have bowel obstructions which persist for more than a few days, when nasogastric suction is employed for extended periods, or when intestinal fistulae discharge a large amount of fluid. In cases of that type, it should be recognized that potassium deficiency may exist before serum levels decrease. If the abnormal fluid losses previously mentioned can be measured accurately, the potassium loss can be calculated. But if the loss is contained chiefly in dressings, analysis of these for potassium is more difficult and calculation then depends upon known average losses in the various fluids. In replacement of potassium it should be borne in mind that the kidney excretes potassium at a steady rate. If too much potassium is supplied at one time by intravenous means, potassium intoxication may occur from elevation of the serum potassium. In conditions of anuria or oliguria, potassium replacement should be undertaken cautiously to avoid potassium excess.

One of the most important factors in postoperative fluid management is the replacement of blood lost at operation or the replacement of blood lost in concealed hemorrhage after the operative procedure has been completed. Blood losses of less than 500 cc. usually can be tolerated without prolonging convalescence, and replacement will not be necessary. A practical way to measure blood loss is by hematocrit measurement of packed red cells before operation and comparing it with the measurement on the third postoperative day. If the hematocrit shows a fall of more than 5 points on the third postoperative day, more than 500 cc. of blood has been lost and transfusion is needed. Stanton and coworkers[5] measured blood loss at operation as carefully as could be done and correlated the hematocrit measurement with blood volumes, red cell counts and hemoglobin determinations. They concluded that the hematocrit reading was the most practical and the simplest method of determining blood loss. Certain cholecystectomies and hysterectomies are often associated with greater blood loss than is apparent during the procedure, and in many of these operations transfusions should be given following operation to correct for these losses. Both blood volume and hemoglobin concentration should, of course, be brought to normal levels before major operation is undertaken.

CALORIC AND PROTEIN REQUIREMENTS

The problem of maintaining caloric and protein requirements has received much attention in recent years. The clue to proper management lies almost entirely in the field of preoperative preparation of the patient. A patient in a state of good nutrition can tolerate without difficulty a few days of relative starvation. It is known that a few grams of dextrose administered to a starving patient will greatly decrease his rate of catabolism and nitrogen excretion. Two liters of 5 per cent dextrose in distilled water will provide 100 gm. of dextrose or 400 calories. This amount of dextrose will greatly spare the protein loss. Two hundred gm. of dextrose provided in 2 liters of 10 per cent dextrose in water will not appreciably further decrease the protein breakdown and a good portion of the extra dextrose administered will be excreted in the urine.[2] Great efforts have been made to provide enough protein parenterally in amounts greater than are excreted as urinary nitrogen. This can best be done by the administration of irradiated plasma in 1,000 to 2,000 cc. amounts.[1] The cost of such administration is almost prohibitive and the effectiveness of therapy requires determinations of total circulating protein and careful quantitative analyses of all body excretions and drainages. Laboratory facilities to do this are not

ordinarily available. It should be emphasized that serum or plasma protein concentration values have little clinical significance if the plasma volume is unknown. A person in a starvation state may have normal plasma protein concentration because of decrease in plasma volume.

Protein hydrolysates are metabolized chiefly as calories even when administered with dextrose solutions, and have little effect in decreasing the nitrogen excretion. Used as supplementary nitrogen to an adequate oral caloric intake, they will be metabolized as protein.

At present there is no satisfactory method of providing calories parenterally in amounts large enough for minimal daily requirements. If 10 per cent dextrose solutions were used, 4,000 to 5,000 cc. daily would be required. If this amount of fluid were given in a 24-hour period, a large portion of it would be lost in the urine. A great many more calories may be provided in the simplest type of oral feeding as soon as the alimentary canal can function postoperatively. The alimentary canal also provides the quickest and best avenue of assimilating protein.

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NOTICE

Notice of the source of the photographs used with the article Cancer of the Skin by Harry J. Templeton, M.D., which was a part of a trilogy on Malignancies of the Skin in the September issue of CALIFORNIA MEDICINE, was inadvertently omitted. The pictures were supplied by the Alameda County Highland Hospital Cancer Clinic.

Results of Irradiation in Cancer of the Lip, Tongue and Ear

L. H. Garland, M.D., and Merrell Sisson, M.D., *San Francisco*

SUMMARY

Cancer of the lip: The primary lesion can be controlled by irradiation in approximately 80 per cent of cases. For lesions with metastases there is only about a 25 per cent chance of five-year arrest (irradiation of the primary lesion followed by excision of involved nodes).

Cancer of the tongue: Lesions in the anterior two-thirds are controllable by irradiation in about 50 per cent of cases if the nodes are not involved; the salvage is only about 15 per cent if the nodes are involved (nodes treated surgically). Lesions in the posterior third of the tongue are seldom controlled in the authors' experience.

Cancer of the ear (auricle): Five-year arrest of basal-cell lesions should be attained by irradiation in about 80 per cent of cases; of squamous-cell lesions in about 60 per cent. If the lesion is extensive, radiation does not offer a superior cosmetic result to operation and entails danger of late chondronecrosis. Therefore extensive lesions are probably best treated surgically. In either event, it appears probable that results of irradiation can be improved by the use of more adequate fields and greater fractionation.

THERE have been almost as many ways of treating epidermoid cancer of accessible sites as there have been men doing it. The authors believe, on the basis of some 20 years of clinical experience, that the cosmetic and functional results of correctly used radiation are in general superior to those obtainable by other known methods. At the same time, it is readily agreed—and emphasized—that the cure of some minute and questionable lesions is often best achieved by the simple excisional procedure necessary for biopsy, and that very advanced lesions with bone involvement may best be handled by truly radical operation. Between these two extremes lie most cases—those in which irradiation is believed to be the method of choice.

If there is clinical evidence of limited lymph node involvement, surgical removal of the nodes is usually indicated. If involvement is extensive or the nodes appear clinically to be inoperable (deep, fixed, etc.), irradiation will provide temporary control in a fair number of cases and permanent arrest in a few. Prophylactic neck node dissection has not been recommended on the Stanford Service at the San Francisco Hospital.

Lesions recurrent centrally after previous irradiation are usually best treated by excision or electrocoagulation; those with marginal recurrence, or recurrence after inadequate dosage, may sometimes be cured by radical re-irradiation.

The following report is a summary of the early and late results of irradiation in the treatment of cancer of the lip, tongue and ear at the San Francisco Hospital and in the authors' private practice during the 17 years 1932-1948 inclusive. Most of the lip lesions, all of the tongue tumors and many of the ear lesions were verified by microscopic examination. Almost all of the biopsied lip lesions were squamous-cell carcinomas; the tongue lesions were squamous-cell tumors; the ear lesions were basal, basosquamous or squamous-cell carcinomas.

Many of the patients, especially those observed at the San Francisco Hospital, had advanced lesions with metastases at the time of admission. Usually in such cases only palliative irradiation was given. Other patients had recurrence of lesions previously treated elsewhere. A few had multiple lesions (face, eyelids, ear, etc.). The most noteworthy in this group was a man, 74 years of age, with 14 different basal-cell cancers on the head.

Attempts were made to follow the results in as many patients as possible. This was readily accomplished in those cases early in the series in which the treatment failed, notably in cases of tumor of the tongue. A goodly number of the patients were elderly persons who died of intercurrent disease before a five-year follow-up period had elapsed.

In cases of involved, inoperable nodes external roentgen therapy to skin tolerance was given. If the lesion was operable, the patient was referred for surgical treatment.

The care and the after-care of skin and mucosal reactions were conducted along conservative and expectant lines.

CANCER OF THE LIP

Material. One hundred and twenty-one patients were observed; 105 had a full course of treatment. Eleven of the patients when first observed had recurrence of lesions after previous treatment elsewhere, two by roentgen therapy, two by radium therapy and seven by operation. (The two who had had radium therapy and the seven who had had operation had been given that treatment elsewhere in private practice.) Of the fully treated patients, eight had lymph node involvement on admission, and node involvement developed in two others subsequent to treatment by the authors.

Read by invitation before the San Francisco Surgical Society in November 1949.

Clinical Stages. In 108 cases the records showed staging as follows:

	Size of Tumor	S. F. Hospital	Office	Total
Stage I	Less than 3 cm.	21	48	69
Stage II	3 to 5 cm.	8	16	24
Stage III	Over 5 cm.	4	1	5
Stage IV	With metastases	9	1	10

Treatment Dosage. Patients with lesions of the lip were treated by fractionated roentgen therapy, using 100 to 200 KV, HVL from 1 Al to 1 Cu, depending on the thickness of the lesion, 200 to 500 r daily for a total dose of from 4,000 to 6,000 r air in one to four weeks.

Reasons for Incomplete Treatment. These included: Advanced tumor in feeble or moribund patient; advanced tumor in patient with distant metastasis; tumor persistent after previous incomplete irradiation elsewhere; irresponsible patient who did not keep appointments; anxiousness of referring surgeon to resect a slowly receding tumor; and development of complications (pneumonia, etc.) during treatment.

Results of Treatment (Table 1). Treatment was completed in 105 cases. In three patients (all with advanced lesions) the lesion was not arrested; two died in one month, one in five months. The other 102 showed initial arrest. In seven cases there was recurrence. Of these, three were marginal recurrences which were re-irradiated and arrested; two were resected and arrested; two were not controlled and the patients died.

In the treated group were 100 patients who, as far as could be traced, remained well for from two to 18 years. Six of them subsequently died of intercurrent disease* (with the lip well). Of the 62 patients observed prior to 1944, 25 have been followed. Five of them are known to have died with cancer and 20 are known to be well. The known five-year arrest rate is therefore 80 per cent. Some of the 37 patients not personally seen have been traced by letter and are reported to be well. None of those so traced were reported to have died with the disease or to have had recurrence, and it is believed reasonable to assume that the arrest rate for the entire group was at least as high as the arrest rate for the completely followed group of 25 (80 per cent).

Reasons for Recurrence. These are believed to be, principally, inadequate size of field irradiated, inadequate dosage, and advanced stage of disease before treatment.

Complications. In one case necrosis of the lip was reported to have developed eight years after treatment. The patient was a male, 60 years of age, with a Stage IV recurrent postoperative lesion. It was given 4,000 r in 33 days in 1940. In 1948, while the patient was under custodial care at Napa State Hospital, "breaking down" in the center of the formerly treated area was reported by telephone. Further details are lacking. The mental status of the patient was such that factitial ulcer was not unlikely.

Results Reported in the Literature. The most informative recent reports are those of Ebenius and of Paterson (Table 2). Both reported five-year arrests of 65 per cent by radiation, in a total of some 953 cases. Of 541 primary cases, Ebenius arrested 80 per cent, and in 208 cases with metastatic nodes apparent arrest both in primary lesion and nodes was obtained in 25 per cent. The best comparable surgical data indicate similar results (65 per cent relative five-year arrests, all treated cases—Sistrunk and co-workers).

Ebenius limited his report strictly to cases of cancer of the vermilion surface of the lip, excluding cancer of the skin at the vermilion border and cancer of the buccal mucosa invading the lip. His data show the increasing use of irradiation in the control of the lip cancer in Sweden over two decades and the excellent cosmetic results obtainable. As in the cases reported upon herein by the authors, the lower lip was involved in 99 per cent of the cases in Ebenius' series.

Metastases were treated by roentgen irradiation and, after three weeks' rest, surgical excision. Recurrences were treated mostly by excision. Radiation necrosis of the lip developed in 8 per cent of cases. In two-thirds of these the necrotic area healed with conservative local treatment; in one-third, excision was carried out.

Concerning the results of neck dissection, Cross and co-workers reported that 36 per cent of patients with neck dissection and pathologically verified

*One each at two years (carcinoma of the prostate), three years (bronchogenic carcinoma), five years (cause unknown), seven years (miliary tuberculosis), 11 years (bronchopneumonia), 12 years (arteriosclerosis).

TABLE 1.—*Cancer of the Lip (1932-48)*

	No. of Cases	Treatment Completed	With Nodes on Admission	Arrested at End of Treatment	Recurrence	Nodes Developed After Treatment	Radiation Necrosis
Hospital	55	39	8	36	4 (6 mo. 1 yr. 2 yr. 3 yr.)	1 (10 mo.)	1 (?) 8 yr., lip
Office	66	66	0	66	3 (10 mo. 20 mo. 2 yr.)	1 (9 mo.)	....
Total	121	105	8	102	7	2	1 (?)

TABLE 2.—*Cancer of the Lip (Reported in the Literature)*

Author	No. of Cases	Treatment Completed	With Nodes on Admission (Per Cent)	Relative 5-yr. Arrests (Per Cent)	Recurrence (Per Cent)	Nodes Developed After Treatment* (Per Cent)	Radiation Necrosis (Per Cent)
Ebenius	807	778	15	64.9†	7	9	8
Paterson (1946)	.....	175	....	65.0	..	..	..

*Duffy, Widmann, Engelstad, Bergendal, Martin and others give average 30 per cent incidence of metastatic nodes (all cases); however, in primary cases treated, node involvement developed in only about 8 per cent.

†Note: The relative five-year arrest rate for 541 primary cases was 80.5 per cent; for 208 cases with metastases, 25.5 per cent. Data regarding the remaining 89 cases of the 778 are not available.

node metastases from lip cancer survived three years.

CANCER OF THE TONGUE

Material. Seventy-one patients were observed; 57 completed treatment as planned. Eleven of the patients had recurrence after treatment elsewhere (eight following irradiation, and three following operation). Twenty-nine had lymph node involvement on admission and in nine others node involvement developed subsequent to treatment by the authors.

Clinical Stage. In 61 cases the records showed staging as follows:

	Size of Tumor	S. F. Hospital	Office	Total
Stage I	Under 3 cm.	6	5	11
Stage II	3 to 5 cm.	4	3	7
Stage III	Over 5 cm.	14	1	15
Stage IV	With metastases	25	3	28

Anatomical location was as follows:

	S. F. Hospital	Office	Total
Anterior 2/3 of tongue	19	10	29
Posterior 1/3 of tongue	20	7	27
Both locations or unclassified	10	5	15

Treatment Dosage. For cancer of the tongue, external roentgen therapy was given to skin tolerance (approximately 3,000 r to each side), followed by intraoral roentgen or radium therapy, to an estimated tumor dose of 5,000 to 6,000 r in four weeks.

Results of Treatment (Table 3). Of the 57 patients who completed treatment, many were frankly incurable from the start, but were given treatment which in the authors' experience has occasionally resulted in long arrest even of advanced lesions. In only 28 was primary arrest obtained; in ten of these there was subsequent recurrence, and in one radiation osteitis developed. The patient with radiation osteitis was a 64-year-old male who had a Stage III cancer of the left side of the middle third of the tongue. In May 1947 he was given external and intraoral roentgen irradiation (2,200 r and 4,400 r respectively) with apparent control. In March 1948 enlarged nodes developed in the left upper cervical region. The patient refused excision of them and 3,850 r was delivered in three weeks to a left lateral cervical field. In February 1949 left oral pain developed. Roentgenograms showed mandibular sclerosis and porosis (presumed to be radiation osteitis). The patient died in June 1949 with node and lung metastases.

In 35 cases treated prior to 1944 there were six known five-year arrests (17 per cent). Three patients died of intercurrent disease, without evidence of local recurrence.

Palliation. The arrest rate is low in tongue lesions. Palliation is often achievable, however, with adequate dosage. Some of the patients treated by the authors received less than 3,000 r tumor dose and were not greatly helped. With regard to the patients treated at the hospital the following observation was made:

Stage III cases: Nine had over 3,000 r tumor dose; four were controlled (two temporarily, two more than five years). Five had less than 3,000 r and none were controlled.

Stage IV cases: Thirteen had over 3,000 r tumor dose; temporary control of the primary lesion was observed in five cases. Twelve had less than 3,000 r, none with control.

Results in the Literature (Table 4). Jacobson reported results with irradiation in 277 cases. Of 103 primary cases, 52 were arrested; of 130 cases with metastasis, 15 were arrested. The relative five-year arrest rate for all cases was 28 per cent. The dosage (in roentgen treated cases) was approximately 5,500 r tumor in 17 days. Paterson reported an identical five-year arrest rate in 465 cases (28 per cent).

TABLE 3.—*Cancer of the Tongue (1932-48)*

	No. of Cases	Treatment Completed	With Nodes on Admission	Arrested at End of Treatment	Recurrence	Nodes Developed After Treatment	Radiation Necrosis
Hospital	49	37	23	18 (including 4 with nodes)	10	7	1 (bone)
Office	22	20	6	10 (including 2 with nodes)	?	2	..
Total	71	57	29	28	10	9	1

TABLE 4.—*Cancer of the Tongue (Reported in the Literature)*

Author	No. of Cases	Treatment Completed	With Nodes on Admission (Per Cent)	Relative 5-Yr. Arrests (Per Cent)	Recurrence (Per Cent)	Nodes Developed After Treatment (Per Cent)	Radiation Necrosis (Cases)
Jacobson (1948)	318	277	48	28*	11	12	4 tongue 10 skin 15 jaw
Paterson (1947)	.....	465	....	28	....	....	....
Peterson (1948)	.....	105	58	23	....	9	....

*Note: The relative five-year arrest rate for 103 primary cases was 52 per cent; for 130 cases with metastases, 15 per cent. Data regarding the remaining 44 cases of the 277 are not available.

The Radium Institute (Paris) is reported by Ackerman and Regato to have had the following results:

Location of Lesion		
Anterior 2/3 (494 cases)	56 per cent without recurrence during subsequent course	23 per cent well and free of disease after five years
Posterior 1/3 (127 cases)	.....	5.5 per cent well after five years

CANCER OF THE EAR

Material. Twenty-five patients were observed; 23 completed treatment. Five of the patients had recurrence following treatment elsewhere (one after irradiation, four after operation).

Basal-cell lesions predominated. The biopsy diagnosis in 12 cases was basal-cell; in three, basosquamous; in two, squamous. In the rest of the cases the diagnosis was just listed as "cancer" and no biopsy report could be traced. However, it is only fair to add that all patients were referred, and had been observed usually by experienced surgeons, dermatologists or other clinicians prior to treatment. Further, as Ebenius pointed out, while biopsy is always desirable for the record, it is not always essential and may even be misleading. Most cancer workers have seen pathological reports of definite cancer subsequently revised to "nonmalignant process" at the five-year follow-up review; conversely, patients on whom the biopsy report was "no evidence of cancer" may subsequently have extension or metastasis—the original biopsy specimen having been inadequate or from a benign portion of the lesion. These remarks are in elucidation and not defense. Published data should be biopsy-proven whenever possible.

Clinical Stage: In 23 cases the records showed:

	Size of Lesion	S. F. Hospital	Office	Total
Stage I	Under 1 cm.	3	6	9
Stage II	1 to 3 cm.	2	6	8
Stage III	Over 3 cm.	2	3	5
Stage IV	With metastasis or bone involvement	0	1	1

Three cases of cancer of the skin deep in the external auditory canal are not included, since this report deals only with cancer of the external ear or auricle. The auditory canal lesions tend to be diagnosed late, to entail bone involvement, and to be highly incurable by any means.

Treatment Dosage. Lesions of the ear were treated by roentgen therapy in a manner similar to that used for lip lesions.

Results of Treatment (Table 5). Primary arrest was obtained in all of the 23 cases in which treatment was completed. Recurrence is known to have taken place in three patients. One was re-irradiated and resection was done later, one was referred for operation but not traced further, and one could not be followed. In this last case, recurrence was reported by telephone eight years after treatment. The patient refused examination and care by the authors.

Ten patients are known to have had arrest of from one to five years. Of 12 patients treated prior to 1944, it has been possible to trace only two; one with known five-year arrest and one with recurrence. The rest of the 12, followed for shorter periods, are presumed but not known to be well.

Results in the Literature (Table 6). Cancer of the ear is not common and it is difficult to find any large reported series of cases. Strandquist reported 16 of 22 cases arrested for one to six years (73 per cent). In the remaining six cases there was persistence or recurrence, and in five of the group variable degrees of radiation necrosis developed. In three of seven cases of squamous-cell tumor, the growth metastasized to nodes.

Spencer reported treatment of eight advanced recurrent cases with poor results. After reviewing his own work and the recent literature he concluded that while early cancer of the auricle involving the helix is quite curable, advanced cancer (especially cancer arising in the external auditory canal) is not.

Tice and White reported some 29 ear lesions in a group of 358 patients with biopsy-proven skin

TABLE 5.—*Cancer of the Ear (1932-48)*

	No. of Cases	Treatment Completed	With Nodes on Admission	Arrested at End of Treatment	Recurrence	Nodes Developed After Treatment	Radiation Necrosis
Hospital	7	6	0	6	1 (16 mo.)	0	0
Office	18	17	0	17	2 (10 mo. 8 yr.)	0	1
Total	25	23	0	23	3	0	1

TABLE 6.—*Cancer of the Ear (Reported in the Literature)*

Author	No. of Cases	Treatment Completed	With Nodes on Admission	Arrests (1-6 yr.)	Recurrence or Persistence	Nodes Developed After Treatment	Radiation Necrosis
Strandquist (1944)	.....	22	1	16	6	2	5 (4 spontaneous healing. 1 excision)
Tice (1948)	.....	29	....	88% basal-cell 59% squamous-cell	....	....	.....

cancers. Of the basal-cell lesions "88 per cent" were arrested, and of the squamous-cell "59 per cent." "Twelve per cent" of the basal-cell and "41 per cent" of the squamous-cell lesions recurred. These therapists used short intensive roentgen therapy (1,250 r x 4, 90 KV, HVL approximately 1 Al, total dose 5,000 r in one week). The over-all arrest rate was 95 per cent for the basal-cell and 80 per cent for the squamous-cell skin lesions. Radiation ulcers occurred in 4.6 per cent of the entire group.

Dr. N. J. Howard of San Francisco in an unpublished report of a series of squamous-cell cancers of the auricle noted a high incidence of recurrence or cervical node involvement. He favored radical operation and neck dissection.

CASE REPORTS

CASE 1: A man 73 years of age had squamous-cell carcinoma of the lower lip, measuring 3 x 2.5 x 4 cm. There was clinical and microscopic evidence of muscle invasion. There was an enlarged, firm left submental node about 1.5 cm. in diameter. The plan of treatment decided upon was to irradiate the primary lesion and to follow with neck dissection. Twenty doses of 200 r each to a field 4 x 6 cm. in diameter over the lower lip, using 200 KV, HVL 1 mm. Cu, at a distance of 50 cm., were given in October 1941. Resection of the node was advised but refused and the node was given 20 doses of 200 r to a field 6 cm. in diameter. The tumor dose was approximately 4,500 r in three weeks. The growth has been arrested nine years to date.

CASE 2: A 69-year-old man had squamous-cell carcinoma of the lower lip, proven by biopsy. Eighteen doses of 300 r each were given to an area 6 x 3 cm. in diameter (ending with 6 x 2 cm.), using factors similar to those in Case 1, in October 1938. The tumor dose was approximately 6,000 r in three weeks. The growth has been arrested 11 years to date.

CASE 3: A man 58 years of age had squamous-cell carcinoma of the right side of the tongue, middle third. Radiation was given, 4,500 r right extraoral and 4,200 r left extraoral, in January, February and March 1935, to fields 9 to 7 cm. in diameter, using 200 KV, HVL 2 mm. Cu. In May 1936, a small remaining nodule was excised. In October 1936, a low right cervical node developed. Aspiration biopsy showed carcinoma. This grew rapidly and invaded the sternomastoid tendon. Radiation gave temporary arrest. In late 1937 the patient died, with the primary lesion controlled, but with extensive metastases.

CASE 4: A 41-year-old woman had basal-cell carcinoma of the right auricle, recurrent after operation. In 1942 a basal-cell tumor in the lower half of the helix had been excised. There was recurrence in 1944 and reexcision had been carried out. In 1946 there was recurrence at the inferior edge of a 4 cm.-long defect in the helix. Radiation therapy was given in November 1946—12 doses of 500 r each to a field from 3 cm. in diameter down to 2.7 x 2 cm., using 140 KV, HVL 4 Al, at 15 cm. distance. The lesion has been in arrest to date.

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The Distribution of Coccidioidomycosis in Southern California

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SUMMARY

In coccidioidin skin test surveys among persons of high school age in Saugus, Canoga Park, Banning and Palm Springs areas the average incidence of positive reaction was 15 per cent. Although considerably less than the 68 per cent incidence reported among high school students of Kern County, it is high enough to indicate pockets of relatively high endemicity in Southern California below the San Joaquin Valley.

Histoplasmin tests were performed on most of the persons tested with coccidioidin in this survey. The over-all incidence of positive reaction in the group was 7.6 per cent. Most of the subjects with positive reaction to histoplasmin gave a history of having previously lived in some area in the central United States where histoplasmosis is known to be endemic.

A few subjects who had positive reaction to coccidioidin tests and who had lived in areas known to be endemic for coccidioidomycosis but not for histoplasmosis, also had positive reaction to histoplasmin. However, the induration produced was always smaller than that caused by the coccidioidin reaction, and there was minimal confusion in interpreting the tests.

FOR years it was assumed that coccidioidomycosis was acquired almost exclusively in the San Joaquin Valley of California; hence the use of its common colloquial name, "San Joaquin Valley Fever." Other parts of the Pacific Southwest of the United States[1, 3, 6, 9, 10] eventually were recognized to be endemic areas and in 1943 the Office of the Surgeon General, U. S. Army, prepared a distribution map of the known and suspected areas of coccidioidomycosis. In that map, the region of California south of the San Joaquin Valley was depicted only as an "area of suspected endemicity." Subsequent reports of infection of armed forces personnel[18, 20, 22] showed that coccidioidomycosis occurred in several widely distributed areas of that region.

From the Pathology Laboratory, Los Angeles County General Hospital and Department of Microbiology, School of Medicine, University of Southern California, Los Angeles. Aided by a grant from the Research Fund, Los Angeles County Hospital Attending Staff Association and by a contribution to the Bacteriology Research Fund, University of Southern California, by Mr. Lewis S. Rosenstiel.

During the Second World War the microbiology laboratory of the Los Angeles County General Hospital was requested to cooperate with certain of the military units in laboratory and epidemiologic studies on coccidioidomycosis. Reports of certain of these were made available through the courtesy of Dr. George A. Young, Jr., then with the California-Arizona Maneuver Area, and those data which apply to the southern part of California are included in the distribution map of this report.

After Willett and Weiss[22] reported that 83 cases of coccidioidomycosis developed near Banning, California, the laboratory subsequently performed coccidioidin test surveys in the high schools of Banning and Palm Springs in order to determine whether there was an unusually high incidence of positive reaction among the young adults of these related areas.

Los Angeles County General Hospital records showed that a few patients with coccidioidomycosis had been admitted to the hospital from surrounding counties. These led to a study of the records of coccidioidomycosis in county hospitals of those counties in order to determine whether such cases had without doubt originated in the counties. Reports of cases from Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties were verified and are included in this study.

Los Angeles County General Hospital records also indicated that cases had originated near Canoga Park in the San Fernando Valley and suggested this region as an endemic focus. Seven patients with coccidioidomycosis[11] were subsequently admitted to the Los Angeles County General Hospital in the fall of 1948 from a Los Angeles County probation camp near Saugus, which is 12 miles north of San Fernando.

These observations led to the organization of serial skin test and serial complement fixation test surveys in three probation camps within the county, and also to coccidioidin test surveys in Canoga Park and Newhall high schools. A similar survey in Los Angeles High School, located within the city of Los Angeles, was organized as a control.

This report, therefore, includes information on coccidioidomycosis derived from the following sources: (1) Certain reports among the armed forces stationed in southern California during the Second World War; (2) reports of cases from county hospital records in Southern California or from

physicians within the area, these reports having been checked to determine whether or not the patient was a permanent resident of the area; (3) an outbreak of coccidioidomycosis in a Los Angeles County probation camp near Saugus, together with serial skin test surveys made in this camp and in two other camps within the county; (4) skin test surveys in five different high schools within the area (see map and Table 1).

Recent reports in the medical literature[2,5,16,17,21] on the distribution of histoplasmosis as based on histoplasmin surveys and questions relating to the specificity of the coccidioidin and histoplasmin reactions suggested the desirability of performing histoplasmin tests. These were performed on 984 of the individuals tested in the course of this study (see Table 2).

The histoplasmin used was from Lot H3 prepared by Dr. C. W. Emmons of the National Institutes of Health, and was furnished through the courtesy of Dr. C. E. Palmer. It was used in a dilution of 1:1,000.

The coccidioidin was from Lot A1 prepared in the Los Angeles County Hospital Laboratory by methods described by Kessel and co-workers.[10] It was used in a dilution of 1:100.

One-tenth cubic centimeter of each antigen was injected intracutaneously into the flexor surface of the forearm, and the results were observed 48 hours after injection. The results were scaled as follows:

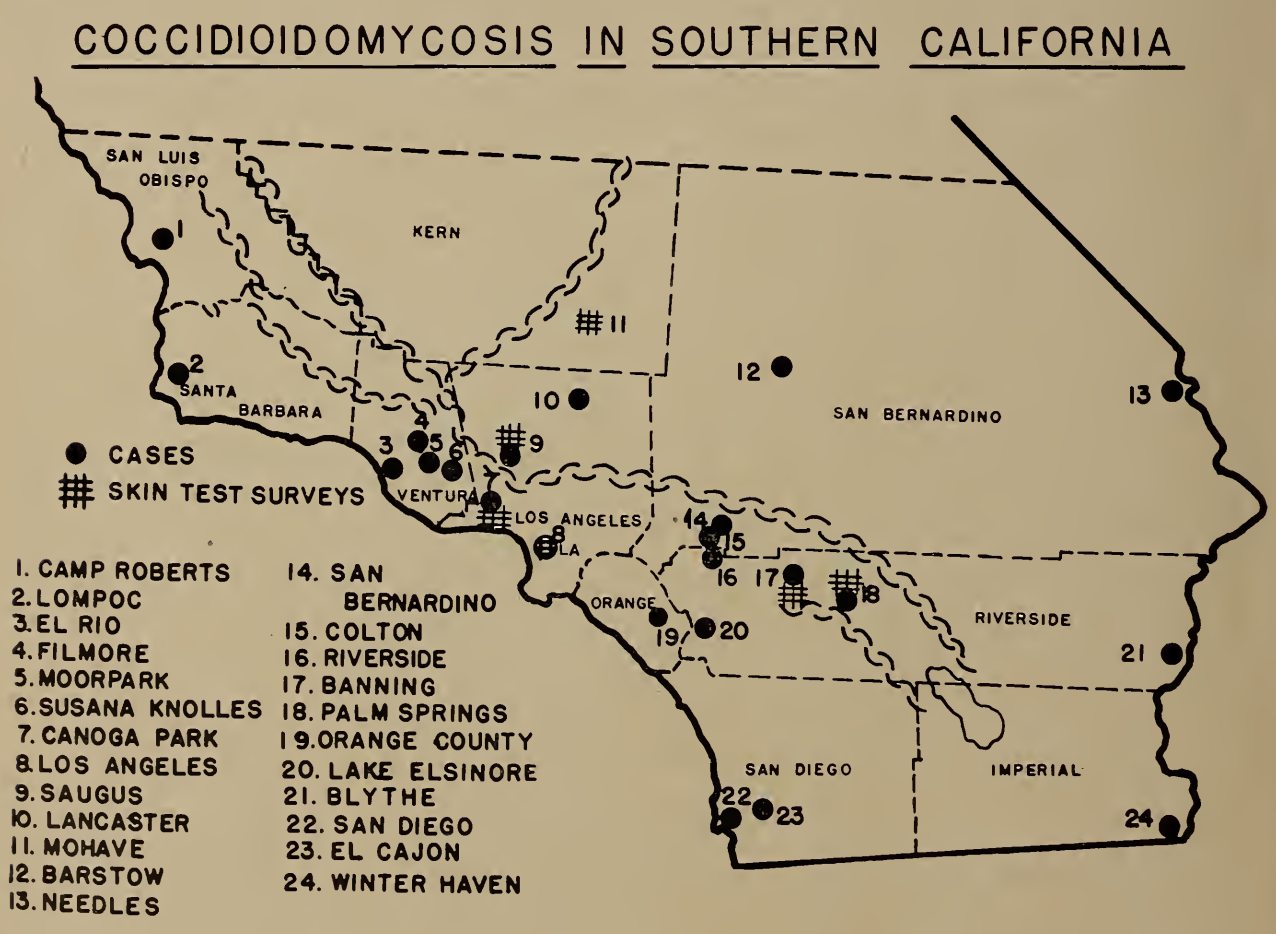
1+, = 5 to 9 mm. induration
2+, = 10 to 14 mm. induration
3+, = 15 or more mm. induration
4+, = 15 or more mm. induration plus necrosis.
Erythema alone was not regarded as a positive reaction.

RESULTS AND DISCUSSION

Coccidioidomycosis

The results of the coccidioidin surveys are summarized in Table 1. Of the 1,058 persons tested, 122 (11.5 per cent) had positive reaction. The range for the groups tested varied from 4 per cent in the Los Angeles High School to 20 per cent in the Banning and Palm Springs high schools. Since it was desired to determine the incidence of coccidioidin reactors who had acquired sensitivity in each area studied, careful histories of past and current residence in areas previously established for either coccidioidomycosis or histoplasmosis were taken from each one tested.

The persons tested were separated into two groups (Table 1), one group comprising those with previous residence in an area in which coccidioidomycosis was endemic, the other comprising those who had not resided in a known endemic area. "Residence," in this presentation, indicates residence of more than one month in a known endemic area. A majority of the reactors had resided at some time in areas previously recognized to be endemic; in this



group, the lowest percentage of positive reactors in any of the seven areas in which tests were conducted was 16 (probation camp, Azusa) and the highest was 30 (Newhall High School). In the other group, the range was from no positive reactors in one of the seven areas to 17 per cent in another.

It is assumed that there is little or no endemic coccidioidomycosis in the areas in which there was low incidence of positive reaction to coccidioidin tests. On the other hand, the three areas in which the highest incidence of positive reaction was recorded—the average for the three was 15 per cent —may be considered as newly recognized endemic areas. These are the Banning-Palm Springs area in which Willett and Weiss[22] reported 83 cases of coccidioidomycosis; Camp 4 near Saugus, from which seven patients with the disease were admitted to the Los Angeles County General Hospital in October 1948;[11] and Canoga Park, in the San Fernando Valley where several patients were suspected to have become infected. The average incidence of positive reactions (15 per cent) in the three newly recognized areas of endemicity in Southern California compares with an incidence of 68 per cent reported by Gifford[8] in similar age groups in Kern County high schools.

It is of particular interest to compare the low percentage found in the Los Angeles High School students with the higher percentages in the other high school groups. For the entire group of Los Angeles High School students tested, the incidence of positive reactions was 4 per cent, and it was only 1.6 per cent for those who were not aware of having lived in areas known to be endemic for coccidioidomycosis. The Los Angeles High School is in the center of the City of Los Angeles, and the students may be cited as a satisfactory control group, since they have a minimum opportunity for exposure to dust containing arthrospores of Coccidioides immitis. Such opportunity would be afforded only by occasional trips to known endemic areas or by exposure to arthrospores brought to Los Angeles from known endemic areas in dust, in cars, clothing or other objects. Reports in the past have shown that coccidioides may be transferred in this manner.

Distribution Map

In the past, the tendency in reporting mycotic diseases has often been to indicate the area where an infection was diagnosed or where the sensitivity of a patient was observed, without regard to his past residential history. This may lead to an entirely erroneous impression regarding geographical distribution of a disease, since the infection may have been acquired in a region quite remote from the one where the case was reported. In the accompanying map the cases of the disease and the sensitivity causing positive reaction to skin test were verified to have been acquired in the areas marked.

Evidence from these sources, together with reports of cases in military personnel stationed in the same geographic areas during and since the Second World War, shows that infections may be acquired in the following Southern California counties: Kern, southeast of Tehachapi,[18] San Luis Obispo,[20] Santa Barbara,[19] Ventura, Los Angeles,[11] Orange, Riverside,*[22] San Bernardino,* San Diego,[13-15] and Imperial.* These data point to a wide distribution of Coccidioides immitis in the southern part of California, and the map is not presumed to be complete. The cases reported to date also indicate that isolated pockets or areas of high infection rate may exist interspersed with areas of low endemicity.

Histoplasmin Surveys

The histoplasmin tests made in this study are summarized in Table 2. Of 984 persons tested, 75 (7.6 per cent) had positive reactions. These reactors were divided into two groups—those in Group 1 having previously resided in a known histoplasmosis area as judged by the map prepared by Smith and co-workers,[21] and those in Group 2 never having resided in an area in which histoplasmosis is known to occur. There was pronounced difference in incidence of reactions between the two groups. In Group 1 the percentage of positive reactors ranged from 14 per cent in the Los Angeles High School group to 45 per cent in Camp 5. In Group 2 there were few who had positive reaction to histoplasmin,

*Endemicity in Areas 13, 21 and 24 (on the map) was reported by the California-Arizona Maneuver Area.

TABLE 1.—*Coccidioidin Surveys in Southern California Areas*

Area	Total No. Tested	Total No. Positive	Per Cent Positive	Prev. Residence in Coccid. Area		No Residence in Known Coccid. Area	
				No.	Per Cent +	No.	Per Cent +
Probation Camps:							
No. 4 Saugus	100	14	14	31	20	69	12
No. 3 Calabasas	78	6	8	25	25	53	0
No. 5 Azusa	60	4	7	27	14	33	3
High Schools:							
Banning and Palm Springs	74	15	20	21	21	53	17
Canoga Park	441	65	15	82	24	359	13
Newhall	85	9	11	20	30	65	5
Los Angeles	220	9	4	38	16	182	1.6
Total	1,058	122	11.5				

with the range from zero to 4 per cent. Most of those tested in this Southern California survey who had positive reaction to histoplasmin, had previously lived in areas reported to be endemic for histoplasmosis. A related observation is that in the three clinical cases of histoplasmosis reported in the literature as occurring in California, the patients had previously lived in Louisiana,[4] Tennessee,[12] and Nebraska,[14] respectively.

Such observations further illustrate the importance, in epidemiologic studies, of ascertaining the previous residences of patients before the geographic origin of a given case is assigned.

Double Reactions

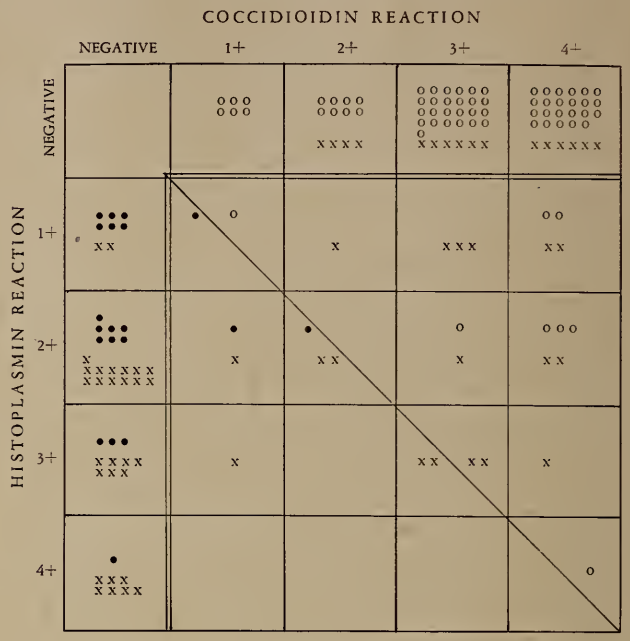
Chart 1 shows the intensity of reaction to coccidioidin and histoplasmin in 153 cases in relation to the residence history of the subjects tested.

In the chart it may be noted that: (1) The 78 cases in which there was positive reaction to coccidioidin alone are distributed in the top squares—six with 1+ reaction, eight with 2+, 25 with 3+ and 23 with 4+. (2) The 46 cases in which there was positive reaction to histoplasmin alone are distributed in the left hand squares. (3) The 29 cases in which there was positive reaction to both tests are scattered among the remaining 16 squares of the table.

Of the 29 persons with reaction to both coccidioidin and histoplasmin, 18 had lived in both coccidioidomycosis and histoplasmosis areas, three had lived in histoplasmosis areas and eight had lived only in coccidioidomycosis areas. The three who had previously lived solely in histoplasmosis areas but now live in Southern California are likely to have passed through an area in which coccidioidomycosis is prevalent—Arizona or the San Joaquin Valley—in order to reach the southern part of California. Therefore, possibility of sensitization to coccidioides en route to Southern California cannot be excluded. For this reason, no attempt is made to evaluate the cross-reactions in this group of persons. Cross-reactions in persons from histoplasmosis areas can best be studied in subjects who have never travelled in an area in which coccidioides is known to be present.

With regard to the eight persons who had lived only in coccidioidomycosis areas, yet had positive reaction to histoplasmin as well as to coccidioidin,

Chart 1.—Graph Showing Residence Histories of Coccidioidin and Histoplasmin Reactors and Relative Severity of Reactions



O Residence in coccidioidomycosis areas only.

X Residence in both coccidioidomycosis and histoplasmosis areas.

● Residence in histoplasmosis areas and travelled through coccidioidomycosis areas.

this should be noted: In six of the eight cases, the reaction to histoplasmin was of different degree than the reaction to coccidioidin; and even in the two cases in which the degree of reaction for the two tests was nominally the same (at 1+ in one instance and 4+ in the other) actually the exact size of the area of induration caused by histoplasmin was smaller than that caused by coccidioidin. There were, therefore, no cases in this series in which identical intensity of the reaction might have led to confusion in reading test results.

Question arises as to why cross-reactions between coccidioidin and histoplasmin occur. Three explanations may be considered. One possibility is that a common sensitivity occurs. (Assuming that is true, it was demonstrable in eight cases in the series reviewed.) Another possibility is that *histoplasma capsulatum* exists to a limited extent in the areas in question and some persons become sensitized to

TABLE 2.—*Histoplasmin Surveys in Southern California Areas*

Area	Total No. Tested	Total No. Positive	Per Cent Positive	Prev. Residence in Histo. Area		No Residence in Known Histo. Area	
				No.	Per Cent +	No.	Per Cent +
Camp No. 4	100	9	9	21	25	79	2.5
Camp No. 3	78	8	10	24	25	54	4.0
Camp No. 5	60	5	8	11	45	49	0.0
Canoga Park	441	30	7	164	17	277	0.7
Newhall	85	11	13.0	28	32	57	4.0
Los Angeles	220	12	6	86	14	124	0.0
Total	984	75	7.6				

this specific antigen. A third possibility is that some other fungus in the area induces intradermal sensitivity to histoplasmin. The latter two possibilities can be determined only by future investigation, and at present only the first suggestion will be reviewed.

Emmons[7] in animal experiments observed that two out of seven guinea pigs infected with Coccidioides immitis gave positive reactions when tested with histoplasmin. Of ten animals inoculated with Coccidioides immitis in a study by the authors, two had slight histoplasmin reaction. Since the cross-reactions both in experimental animals and in man observed in these studies are consistently less severe than the reaction with the specific or homologous antigen, there is little danger of confusion in reading the test. Smith and co-workers also drew this conclusion, although they left the impression that cross-reactions between coccidioidin and histoplasmin occur in a considerably higher percentage of persons than was observed in this study. They did not, however, give the previous residential histories of the persons tested. In fact, they stated, "Of course, one asks if these reactions to histoplasmin might not have been the results of independently acquired sensitivity to histoplasmin. In most instances this possibility could not be excluded." They did, however, cite 31 cases of coccidioidomycosis in which, prior to the onset of symptoms, the patients had negative reaction to both coccidioidin and histoplasmin. In this group, all patients subsequently had positive reaction to both coccidioidin and histoplasmin. In correspondence concerning the differences in incidence observed in the two different surveys, Dr. Smith suggested that the variable results may lie in differences in the histoplasmin used.

In the Los Angeles County Hospital 15 patients with proven active coccidioidomycosis recently were tested with both coccidioidin and histoplasmin. Five were tested with Lot H3 histoplasmin used in the survey herein reported, and ten with Lot H40 procured from Dr. E. S. Weiss and used in a dilution of 1:500. None of the 15 patients had previously lived in a known histoplasmosis area. All had positive reaction to coccidioidin and none had a positive reaction to histoplasmin. This observation further supports the thesis that minimal confusion occurs in the differentiation of coccidioidin and histoplasmin reactions.

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Therapy of Parkinson's Disease

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SUMMARY

The most disabling form of Parkinsonism is that occurring after encephalitis. It may occur in persons of any age. The results of surgical treatment, which has been used for the most part only for seriously handicapped patients, have been discouraging in general, although in a few isolated circumstances operation has been of dramatic benefit.

The solanaceous alkaloids—atropine, stramonium and hyoscine—either in pure forms or in mixed extracts or tinctures — are the best established drugs at present for the treatment of the postencephalitic forms of Parkinsonism. They have not proven too helpful for patients in the older age group with paralysis agitans. The antihistaminic compounds, particularly Benadryl,® have been a very valuable addition. They are of greatest value for patients in the older age group. The newer synthetic compounds, Artane® and Panparnit,® are also valuable additions. Amphetamine and the related and subsequently produced agents in this group are very helpful for patients showing undue fatigue and lethargy. Tolserol® is proving helpful, particularly for patients with painful spasms of rigid muscles.

In a review of the literature it was noted that paralysis agitans of the degenerative or arteriosclerotic type appearing late in life seemed to be most commonly commented upon.

Beginning in 1917, just 100 years after James Parkinson had described the disease as a syndrome, and particularly during the winters of 1918 through 1920, serious attacks of epidemic encephalitis occurred. Following this pandemic numerous manifestations of a syndrome resembling paralysis agitans occurred. This latter syndrome is now referred to as postencephalitic Parkinsonism. The postencephalitic form differs from the classic description by Parkinson in that persons of any age may be affected and there are many associated symptoms which make the condition more disabling. Most investigators[7, 10] consider paralysis agitans and Parkinsonism as synonymous and group them under three general headings: Postencephalitic, idiopathic, and arteriosclerotic. The syndrome is occasionally observed in toxic, neoplastic or post-traumatic states. While rare, these conditions must be considered in differential diagnosis.

Basically the disease is an involvement of the extrapyramidal portion of the central nervous system.[3, 4, 5] It varies in intensity and extent throughout the structures of this system. Owing to lack of knowledge of the anatomy and physiology of the structures, the pathophysiological disturbances of this disease cannot be concisely explained. The most common sites of pathologic change are the globus pallidus, the putamen and the substantia nigra. The cortex is less frequently involved, and the corpus Luysii and the red nuclei only occasionally. Recent investigators have been directing their attention to the reticular substance, and in all probability this latter locus will prove to be an important area for study and understanding.

The commonly observed signs are: Increased muscle tonus (rigidity), tremor of rest, flexed posture and festination of gait—the classical picture of paralysis agitans. Persons with the postencephalitic form of the disease have, in addition, increased salivation, oily skin, oculogyric crisis, and reversals of sleep rhythms. Psychic disturbances occur and must be considered in all therapeutic programs. As in all chronic illnesses, discouragement and depression are common. The psychic symptoms at times become very distressing or disabling. This is particularly true in younger persons in whom behavior disorders are often the only evidence of the disease. As the patient's intellect is seldom affected, psychotherapy is important.

Parkinsonism can be classified as mild, intermediate or severe. In the mild cases, quite often the patient is more comfortable on a good hygienic regimen than with medication. The side-reactions accompanying the use of drugs are quite often so distressing that the patient with mild Parkinsonism would prefer getting along without drugs. The greatest opportunity to aid with medication exists in the intermediate group.

TREATMENT

The first attack upon this problem should therefore be directed toward psychic rehabilitation and maintaining physical strength and vigor in the patient. It is wise to avoid terms alarming to the patient—terms such as "shaking paralysis," "creeping paralysis," and "sleeping sickness." It is far better to emphasize the slowness of progression of the disease and to reassure the patient in any possible manner. Often this entails a reordering of the patient's life. As mental or physical fatigue intensifies the symptoms, activities should be planned accordingly. There should be a moderate amount of

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outdoor activity. As the rigid muscles respond to heat, physiotherapy in the form of baking and massage is indicated. For patients with muscle spasm, a warm bath before retiring may be helpful.

The postencephalitic form is a sequel to epidemic encephalitis. It may, but rarely does, follow other forms of encephalitis. As knowledge of the anatomy and physiology of the nervous system has developed, surgical approaches to the problem have been made. Areas 6 and 4S have come under scrutiny and some investigators have ablated these areas. At first the results were promising, but in most instances the symptoms returned after recovery from the initial shock of operation. Other areas and tracts have been ablated, with questionable results. Perhaps the greatest surgical success has been achieved in relief of postencephalitic hyperpnea;[8] section of the phrenic nerve relieved the distressing symptoms and restored totally incapacitated patients to reasonable comfort. With an increase of knowledge in the field of neurophysiology as pertains to the extrapyramidal system, it is probable that neurosurgeons will devise means more suited to individual cases. Certainly, attempting surgical relief in severe cases is justified, and the information thereby obtained may permit more rapid advance in all fields of therapy. At present, palliative treatment is about all that is available for the patient with severe Parkinsonism.

The antispasmodic drugs of the solanaceous alkaloids[9] have been, and probably remain, the most useful therapeutic agents. The main alkaloids used are atropine, scopolamine, and stramonium. The early investigators tended to use small doses, but with more experience it was found that massive dosage was necessary. In mild cases the side-effect of mydriasis and the drying up of the saliva was more distressing than the moderate muscular rigidity. It was observed that patients with intermediate Parkinsonism had considerable tolerance for these drugs. With the alkaloids, a minimal dose should be used at first and the dosage then increased to the point of therapeutic results or the patient's tolerance. The response of a patient to an antispasmodic drug may vary from time to time. This does not appear to be ascribable to tolerance or addiction, but rather to variations in the physiological status of the patient. The psychological benefit of changing medication is occasionally the explanation. The older tinctures and extracts were variable in potency. White wine extract has produced a more constant and therapeutically effective drug. There are several satisfactory preparations available.[2, 6, 9] Vinobel® and Rabellon® are examples. Hyoscine hydrobromide, in 0.4 and 0.6 mg. doses, three to 12 times per day, is very helpful to most patients. The greatest usefulness of this drug is in the control of oculogyric crisis. For emphasis: Therapy must be tailored to the peculiar needs of each patient and must be altered as the needs change.

Quite often patients complain of undue drowsiness, a distressing symptom of this disease. With the advent of sympathomimetic drugs (ephedrine, amphetamine),[2] it was realized that they were logical additions to the therapeutic program of these patients. From 10 to 25 mg. of amphetamine is usually given at the time the patient rises in the morning, and if necessary it is repeated around 11 a.m. It is advisable not to give this drug in the afternoon as it may interfere with sleep at night.

Thus, the alkaloids and sympathomimetic drugs constitute the pharmacological armamentarium for the treatment of this disease. The recent chemical synthesis of drugs offering better control of symptoms is a most encouraging development.

ANTIHISTAMINIC DRUGS

Benadryl,® an antihistaminic, was tried empirically by Budnitz[1] in September 1946. The results were most encouraging. Since then, various other forms of antihistaminics have been tested. In the author's experience Benadryl has proven the drug of choice. It has been most useful for patients with paralysis agitans—relaxing the tonus, reducing the tremor and drying the saliva. The alkaloids, added to the regimen, increased the benefit. Twelve patients with severe paralysis agitans were given Benadryl with alkaloids. Tonus was reduced in each case; tremor was arrested in two and reduced in eight. All the patients showed improvement in that they developed a sense of well-being. In postencephalitic patients, salivation was controlled, emotional expression improved in facial muscles, and a renewed interest in activities was noted by relatives. Benadryl is administered in 50 mg. doses, three to four times per day. The dosage of alkaloids can be reduced gradually as the patient is started on the antihistaminic.

Corbin[2] commented upon the use of a new synthetic antispasmodic agent, Artane.® The pharmacological properties of this compound have been carefully studied. It is supplied in 2 mg. tablets provided with a line for halving the dose. Most patients can tolerate a 2 mg. tablet three times a day. It is usually administered before meals and the dose gradually increased to four or five 2 mg. tablets a day. Uncomfortable side-effects are few and patients who have tolerated high atropine alkaloid doses may be given up to 10 or 15 mg. of Artane a day. The symptoms of toxic effect were reported as minor. Usually these consisted of a feeling of giddiness, unsteadiness of gait, blurring of vision, dryness of the mouth, and occasionally nausea, nervousness and tinnitus. Some patients became extremely nervous and it was reported that two patients had mild delirium. The two patients who had the most pronounced side-effects had a history of sensitivity to other drugs. In cases in which side-effects developed, use of low dosage and building up to tolerance permitted continuance of the drug. Corbin stated that the feeling of nervousness caused by Artane in some cases was controlled by the administration of phenobarbital. It has been the author's experience that most postencephalitic patients do not tolerate sedative drugs well, and for that reason changing to some other therapeutic agent is suggested.

Tolserol®[4,5] is a more recently introduced therapeutic agent which has pronounced spasmolytic effect. Its greatest usefulness is in cases in which muscle spasm and pain are present, or in which dystonic or athetoid movements are complicating factors. This drug is available in four forms: Tablet, capsule, elixir and 2 per cent solution for intravenous use. It is usually administered in doses of 1 gm., three to four times a day. The liquid form is absorbed more rapidly and has proven more satisfactory in the author's experience. The intravenous administration of Tolserol produces a rapid therapeutic level of the drug, and results can be determined in a short period of time.

In 1946, Domenjoz[3] reported pharmacological experiments with a variety of synthetic compounds related to Trasentin® and found that they had approximately one-tenth the antisecretory effect of atropine and yet were powerful antispasmodics. The least toxic and most efficient of these was Panparnit® (introduced under the name of Parpanit®). It is related to atropine and hyoscine in structural formula. Schwab and Leigh[7] reported on this drug. Their work was well controlled, the results well validated, and the action upon muscles determined by electromyelography. The drug is available in a 12.5 mg. tablet and a 50 mg. tablet. It is advised that the drug be given on the following schedule: One 12.5 mg. tablet every three to four hours for five doses during the first day, two 12.5 mg. tablets five times on the second day, three 12.5 mg. tablets five times on the third day, then, beginning on the fourth day, one 50 mg. tablet five times a day. The dosage then may be adjusted up or down according to the patient's needs. Most patients seemingly are benefited on the 50 mg. tablet regimen. It is important to note that the drug is utilized rapidly in the body, and therefore must be administered at three- to four-hour intervals to get maximum results.

When using any of the newer drugs, the alkaloids should be continued. A gradual reduction should be carried out. In many cases the patient is most comfortable if a combination of drugs is continued.

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The Diagnosis and Treatment of Meningitis

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SUMMARY

Treatment of meningitis is no longer a question of the administration of antimeningococcal serum and awaiting results. Today there is at hand an ever expanding armamentarium of drugs effective on various bacteria, rickettsia and some of the larger viruses. The skillful use of these singly or in combination offers an excellent prognosis in most forms of bacterial meningitis. Tuberculous meningitis continues to present a poor outlook, but this has been improved with more intensive therapy. More effective agents are needed in the treatment of this disease.

"Shotgun" therapy may be indicated in critically ill patients prior to accurate bacteriological diagnosis; it is more important that therapy should include an effective agent or combination of agents than to attempt to determine in advance the most potent form of specific therapy. Partially treated purulent meningitis may be confused with aseptic meningitis. There is at present no effective therapeutic agent for the viral meningitides, but the prognosis is favorable in most of these diseases without specific therapy.

DIAGNOSIS is so intimately a part of the treatment of meningitis that the two must be considered together. A review of the disease entities which raise the suspicion of central nervous system disease will aid in consideration of specific treatment.

First in order are diseases which give rise to stiffness of the neck but in which there is no evidence of meningeal reaction or of cellular response or pleocytosis of the cerebrospinal fluid. Patients with such symptoms are frequently referred to a communicable disease unit with a diagnosis of meningitis or poliomyelitis. If pleocytosis is absent, then it is probable that the neck stiffness is caused by either extraneural disease of the head and neck or systemic disease such as bacteremia, pneumonia, pyelitis, or exanthemata. Among the extraneural causes of the symptom are trauma, tumors in the cervical region, and infections of the upper respiratory tract including the associated structures (pharyngitis, sinusitis, otitis media and cervical adenitis). Poliomyelitis will sometimes cause typical symptoms and course without provoking pleocytosis. When the stiffness of the neck is of extraneural origin, pain may interfere with any movement of the head and neck, whereas the patient with meningeal irritation usually retains all movement but flexion. Frequently, a patient with "wry neck" can flex his neck even though he cannot extend or rotate it. The signs of meningeal irritation caused by systemic infections probably are a result of actual irritation of the meningeal vessels. Bacteremia, viremia, or toxemia may provoke nuchal rigidity because of injury to meningeal vessels without pleocytosis or other evidence of actual meningeal infection. The term "meningismus" should be applied only to those cases in which actual invasion of the meninges by a pathogenic organism can be excluded. Disease of the upper respiratory tract may give rise to toxemia and meningismus in addition to local inflammatory reaction.

If the cerebrospinal fluid contains over five leukocytes or any polymorphonuclear leukocytes per cu. mm. (that is, cerebrospinal fluid pleocytosis), then meningitis in the sense of inflammatory response exists, although there is still a possibility that no infectious agent has gained entry. Tumors of the brain and brain stem, heavy metal intoxications, and so-called "neighborhood reactions" must be considered. Neighborhood reactions may arise from conditions such as abscess of the brain or of the lateral sinus. Extension of these processes into the cerebrospinal fluid by rupture of the intervening wall may convert them to frank purulent meningitides.

Hemorrhage may be confused with meningitis. In the presence of neck stiffness and coma, lumbar puncture may be necessary for purposes of differentiation. Although gross blood in the spinal fluid usually confirms the diagnosis of subarachnoid hemorrhage, in some cases there is blood in the spinal fluid of a patient with meningitis. Differentiation is made by counting both the leukocytes and the erythrocytes per cu. mm. of spinal fluid. In cerebral hemorrhage, the leukocytes are present in the same ratio to the erythrocytes as exists in the peripheral blood; in meningitis the number of leukocytes far exceeds the number accounted for in this manner.

If spinal fluid pleocytosis exists and no obvious non-infectious cause can be determined, then it must be assumed that an infectious agent is responsible. There are two main subgroups—infections by bacteria or other larger organisms and infections attributable to viruses or to virus-like agents. These are usually referred to, respectively, as purulent and aseptic meningitides. (More correctly, there should

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be included another classification, serous meningitis, in which there is less pleocytosis than in purulent meningitis; but this term is used for a specific form of tuberculous meningitis which will be referred to later.)

Meningococcal meningitis. Typically, in meningococcal meningitis, pronounced limitation of neck flexion develops in the course of a febrile illness of variable severity. Prostration may be mild or severe. Headache, fever, nausea, vomiting, restlessness, irritability, convulsions, coma, signs of cerebral irritation and increased intracranial pressure may vary widely. Especially in infancy, the evidence of central nervous system disease may be most meager. The presence of a hemorrhagic cutaneous eruption associated with meningeal irritative signs often proclaims the diagnosis. Associated rashes may be nondescript, morbilliform or urticarial and *not* of equal diagnostic significance.

The blood has a high polymorphonuclear cell content with a preponderance of immature forms and absence of eosinophils. Fluid removed at lumbar puncture is often milky white with over a thousand leukocytes—primarily polymorphonuclear—per cu. mm. Chemically, the fluid is abnormally high in protein content and low in sugar.

Bacteriological confirmation of the diagnosis rests on the demonstration of intracellular, Gram-negative diplococci in a smear of the spun sediment and/or in suitable culture media. Often the organisms are not observed on the direct smear—in fact, of all forms of bacteria causing meningitis, the meningococcus is most frequently *not* detected by direct smears or even by cultures, particularly if even minimal specific therapy has been given. However, this interference with the demonstration of organisms may be overcome by adding to the material to be examined or cultured an agent or agents to impair the function of antibiotics previously administered to the patient. Paraminobenzoic acid impedes the action of the sulfonamides and penicillinase inactivates penicillin. A further procedure, often successful if the organisms cannot be demonstrated on smear or regular culture, is inoculation of growing chick embryo with the fluid. Growth is rapid in this medium—positive cultures may be obtained in six to eight hours—and antibiotic inhibition of growth is minimized, presumably because of the active circulation of the embryo.

It should be stressed that even if no bacteriological evidence can be elicited the diagnosis can be established on the basis of meningitis with associated hemorrhagic rash. When these petechiae or purpuric lesions are present, smear or culture of fluid drawn from them may reveal the organisms. Occasionally, the organisms are noted by an alert laboratory technician in the smear of the peripheral blood taken for the differential cell count.

At one time[29] the specific therapy of meningitis as a whole could be covered very simply: Once the diagnosis of purulent meningitis had been made, the patient was given polyvalent anti-meningococcus serum. If he had meningococcal meningitis, he had a chance of recovering; if not, he died. A more recent recommendation,[17] that all forms of meningitis be treated with penicillin given intraspinally, equally ignores the desirability of establishing the exact cause and using an appropriate specific agent in treatment. The modern diversity of specific agents has greatly improved the over-all prognosis.

Some observers[12, 27, 28, 30] are of the opinion that sulfonamide therapy alone is sufficient in most cases of meningococcal meningitis, and it is certainly the agent of prime importance. Others give a combination of penicillin and sulfonamide preference. Aureomycin[8] appears to be effective against the organism, but Long and co-workers[25] designated it as of undetermined value. The recommended dosages are given in Table 1. If the patient is unable to take oral medication, sulfadiazine may be given by hypodermoclysis as sodium sulfadiazine in a concentration of 0.5 to 1 per cent. (A 5 per cent solution may be used, but the risk of tissue slough makes it less desirable.) This subcutaneous route gives a desirable slow continued absorption and sustained blood level rather than the abrupt rise and fall obtained by intravenous administration. It is well, particularly initially, to check the blood levels of sulfadiazine and

TABLE 1.—*Therapy of Meningococcal Meningitis*
(Agents in order of preference)

Drug	Route	Initial Dose	Daily Dose	Level (Blood or serum)	Interval (Hours)	Duration
Sulfadiazine	Oral	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	4	1 week after fever
	Parenteral (Subcut.)	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	8	1 week after fever
Penicillin (Crystalline G)	Parenteral (Intramusc.)	500 to 1,500 u/kg. (0.3 to 1 mg./kg.)	4,000 to 15,000 u/kg. (2.7 to 10 mg./kg.)	>0.2 u/cc.	3	1 week after fever
Penicillin (Procaine G)	Parenteral (Intramusc.)	Not recommended	Same— After disease is under control	>0.2 u/cc.	12	1 week after fever
Aureomycin	Oral	10 to 20 mg./kg.	25 to 100 mg./kg.	.....	4 to 6	1 week after fever
	Parenteral (Intraven.)	5 mg./kg.	15 mg./kg.	.....	8	1 week after fever

adjust the dosage accordingly. The level should be 12 to 15 mg. per 100 cc.

Penicillin dosage calculated on a basis of body weight leads to undertreatment of infants and children because of disproportionate urinary excretion in this age group. It does serve as a rough guide, but the actual dosage should be overgenerously calculated. Although procaine penicillin is given once daily with excellent clinical results in the treatment of many bacterial infections, in the treatment of meningitis it is preferable to maintain optimal blood levels by administering the drug at 12-hour intervals. A range of dosage has been indicated for penicillin and aureomycin. If the infection is obviously more severe the larger dose should be given.

There is now far less enthusiasm for intraspinal injection of drugs than there was formerly, largely because of the effectiveness of administration by the oral and parenteral routes, and the undesirable irritative effects of intraspinal therapy. Hoyne[18, 19] has led the objectors and seems well sustained.[13] (Probably intraspinal therapy of meningitides should be limited to the treatment of tuberculous meningitis, as will be discussed later.)

Overwhelming infection represents great toxemia and requires the use of intravenous dextrose solution, plasma, blood, and supportive agents including large amounts of adrenal extract (whether or not there is evidence of adrenal failure dependent upon adrenal hemorrhage).

Influenzal meningitis now accounts for the majority of hospital admissions for meningitis in infancy and childhood.[10, 16] (Meningococcal meningitis formerly led in this respect, but the incidence has decreased as a result of early and vigorous treatment of febrile illness.) It is primarily a disease of this age group, but does occasionally occur in adults. Usually, the infant has had a respiratory infection—frequently of several weeks' standing. Listlessness, unexplained irritability, anorexia, vomiting and/or rise in temperature may lead the physician to consider central nervous system disease. The anterior fontanelle may be bulging, but if the infant has become severely dehydrated it may be sunken. The neck may or may not be stiff. Flexion of the neck is best tested by putting the infant in a sitting position and holding something attractive on his abdomen. Attempts to force flexion of a child's neck—be he sick or well—are usually met with stubborn resistance. Almost reflex flexion following extension of the neck over the edge of a table may be helpful in totally uncooperative infants and children.

It should be stressed that the diagnosis of meningitis in infancy may rest solely on the finding of purulent cerebrospinal fluid in an infant with unexplained fever.

Grossly and chemically the cerebrospinal fluid is similar to that found in meningococcal meningitis. Smears usually reveal a pleomorphic Gram-negative bacillus which is often incorrectly recognized morphologically because of prominent bipolar granules which give it the appearance of a diplococcus. The organism may be grown on suitable culture media. Inoculation of growing chick embryo may be of value for rapid identification. Organisms from smear or culture may be more definitely identified by the capsule swelling or "quellung" reaction produced by type B antiserum. This reaction is helpful in most instances. The leukocyte count is usually elevated with a polymorphonuclear response. Culture of exudate from foci of infection such as the throat or middle ear may reveal the organism.

Therapy (Table 2) prior to the advent of aureomycin consisted of sulfadiazine, streptomycin and antiserum. Alexander[1, 2, 3] outlined a plan of therapy in which the sugar content of the spinal fluid is used as the criterion of the severity of the disease. Most other observers, including the authors, employ antiserum in cases of unusual severity, using a single dose of from 50 to 200 mg. of immune nitrogen, the size of the dose depending on a rough estimate

TABLE 2.—*Therapy of Influenzal Meningitis*
(Agents in order of preference)

Drug	Route	Initial Dose	Daily Dose	Level (Blood or serum)	Interval (Hours)	Duration
Streptomycin (Dihydro-)	Parenteral (Intramusc.)	10 to 15 mg./kg.	40 to 60 mg./kg.	.....	4 to 6	5 days
Aureomycin	Oral	10 to 20 mg./kg.	25 to 100 mg./kg.	.....	4 to 6	2 weeks after fever
	Parenteral (Intraven.)	5 mg./kg.	15 mg./kg.	.....	8	2 weeks after fever
Sulfadiazine	Oral	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	4	2 weeks after fever
	Parenteral (Subcut.)	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	8	2 weeks after fever
Antiserum (Type B)	Parenteral (Intraven. or intramusc.)	50 to 200 mg.	Immune Nitrogen	.....	....	Administered once in most cases

Alexander recommends:	Spinal Fluid Sugar
25 mg. immune nitrogen	Over 40 mg.%
50 mg. immune nitrogen	25 to 40 mg.%
75 mg. immune nitrogen	15 to 25 mg.%
100 mg. immune nitrogen	Under 15 mg.%

Plus intrathecal streptomycin 25-50 mg. each day for 4-5 days.

of the severity of the disease and the size of the patient. The demonstrable presence of excess antibody in the serum may be used as a guide in extreme cases in which repeated administration is required. Antiserum should be diluted in several volumes of saline and given slowly so as to avoid the possibility of severe reactions. The use of either streptomycin or antiserum intraspinally is advised by some observers,[1, 2, 3, 36, 37] considered unnecessary and injurious by others.[15, 19]

Although reports are as yet incomplete, aureomycin appears to be superior in effectiveness to streptomycin and does not present the hazard of deafness caused by injury of the eighth nerve. Long and coworkers[25] suggested the combination of aureomycin and sulfadiazine as the therapy of choice. Chloramphenicol is apparently effective in vitro and probably is equally effective in vivo. Certainly, in the severe case, aureomycin, streptomycin, sulfadiazine and antiserum may be given in combination. Streptomycin can be discontinued by the fifth day with almost complete avoidance of injury to the eighth nerve.

Supportive measures, especially the judicious administration of fluids and blood, are of particular importance in this disease in which most of the patients are infants and young children. Recently, Ingraham and Smith[26, 31] emphasized the need for exploration and surgical drainage of fluid collections in the meninges following influenzal meningitis.

Even with optimal therapy the outlook for infants under nine months of age is poor. Bloor and coworkers[4] reported a mortality rate of over 40 per cent in this age group. In those who recovered there was a striking incidence of major and minor neurological disturbances. However, in private practice and with early diagnosis the results are better; the recovery rate is 90 per cent and there are few sequelae.

Pneumococcal meningitis may occur in any age group. It is frequently secondary to sinusitis—especially that involving the sphenoid sinus—and middle ear infections. The symptoms and signs are similar to those described for meningococcal meningitis except that the patient is liable to become comatose quickly. The results of blood examination are consistent with those of acute bacterial disease. The spinal fluid is almost cream-like in consistency in many instances. Smear and culture of the spinal fluid will usually reveal the organism which can then be typed as an aid in diagnosis as well as possible therapy with type-specific antiserum. The organism may also be recovered from the blood and from foci of infection.

Penicillin is the therapeutic agent of choice, but sulfadiazine should always be given concomitantly (Table 3). The value of aureomycin[25] and chloramphenicol is as yet incompletely determined. Type-specific antisera are used infrequently. The intraspinal route of administering therapeutic agents is used less than formerly, but would seem logical in cases in which there is actual empyema of the subarachnoid space. Dowling[14] stressed the use of massive intramuscular doses of penicillin — 1,000,000 units every two hours—without intraspinal or sulfonamide therapy. Neurological complications are frequent, but the percentage of patients with no sequelae is remarkably improved since the advent of penicillin therapy. In reviewing the cases of pneumococcal meningitis treated at Children's Hospital in San Francisco, it is of interest that there has been only one death since penicillin has been used in treatment, and the patient was moribund on admission. This is particularly remarkable in view of the small doses of penicillin that were given in the first months of its use. It should be emphasized, however, that no one agent should be relied upon and that therapy should be instituted as soon as a working diagnosis is established and fluid has been obtained for study. Surgical treatment of the primary focus of infection should be carried out concomitantly when indicated.

Colon bacilli are the cause of the most common form of meningitis in the neonatal period. Infection may be associated with an abrasion, or with anatomical defects such as spina bifida or meningocele; or the portal of infection may not be apparent. In this age period, signs and symptoms may be entirely lacking or may be similar to those observed in influenzal meningitis. Frequently, the disease is not diagnosed until autopsy following a sudden, unexplained neonatal death. Meningitis should be con-

TABLE 3.—*Therapy of Pneumococcal Meningitis*
(Agents in order of preference)

Drug	Route	Initial Dose	Daily Dose	Level (Blood or serum)	Interval (Hours)	Duration
Penicillin (Crystalline G)	Parenteral (Intramusc.)	1,500 to 15,000 u/kg. (1 to 10 mg./kg.)	15,000 to 170,000 u/kg. (10 to 110 mg./kg.)	1 to 2 u/cc.	2 to 3	1 week after fever, abnormal neurological signs
Penicillin (Procaine G)	Parenteral (Intramusc.)	Not recommended	Same—After disease under control	1 to 2 u/cc.	12	1 week after fever, abnormal neurological signs
(The upper dosage is that recommended by Dowling—1,000,000 units every 2 hours in adults)						
Sulfadiazine	Oral	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	4	1 week after fever, abnormal neurological signs
	Parenteral (Subcut.)	75 mg./kg.	150 mg./kg.	12 to 15 mg.%	8	

sidered a possibility in an infant with unexplained fever and irritability. The spinal fluid is similar to that in influenzal meningitis. Organisms may be found on smear and culture of the spinal fluid and on culture of the blood.

Aureomycin[25, 32] and chloramphenicol appear to be the therapeutic agents of choice in infections by E. coli. Prior to the advent of these antibiotics,[12, 19] streptomycin and sulfadiazine were used with some success.

Obviously, diagnosis in neonatal infants is a greater problem than is therapy, but continued alertness plus the prophylactic use of antibiotics when predisposing conditions are present at birth should reduce the mortality from this source. The response to therapy in infancy is not good. Even though the responsible organism may be of low virulence, the host resistance is poor and antibiotic agents have a low degree of specificity.

The Salmonella organisms, including S. typhosa, cause meningitis on rare occasions. The disease is much like that caused by the colon bacilli. It usually occurs in young infants. Therapy includes the four antibiotics referred to in discussion of the treatment of E. coli meningitis. Chloramphenicol[25, 32] seems to be more effective than aureomycin in controlling most Salmonella infections. If possible the organism should be tested for sensitivity to the various agents, but because therapy must be started immediately, this cannot be done before treatment is under way. Because of the lack of specificity, more than one agent should be employed and the effectiveness of several explored by laboratory tests and clinical observation.

Streptococci and staphylococci may cause meningitis, but the incidence has dropped sharply with the rarity of mastoiditis now that specific therapy for otitis media is available. Before the use of antibiotics, infection of the middle ear often became chronic, led to mastoiditis, then to mastoidectomy with exploration of the lateral sinus, and finally to meningitis. The beta hemolytic streptococcus and staphylococcus aureus were the major offenders.

Therapy should be massive and combined—probably sulfadiazine, penicillin,[12, 25, 32] and aureomycin should be used in combination in large doses. As previous therapy may have rendered the organism resistant to one or more of the agents, sensitivity tests should be carried out. If resistance is observed, dosage may be increased or other agents tried.

Gonococcic meningitis is rare. Penicillin[25] is the therapeutic agent of choice, but all the available antibiotics have some effect. Sensitivity tests in vitro are invaluable in planning continued therapy in severe cases.

Tuberculous meningitis is an infrequent but ominous complication of tuberculous infection. It is thought to be associated with the primary spread of the infection, but the meningeal focus may remain quiescent for an indefinite period. In support of the association with primary tuberculous disease is the observation by European workers[9, 35] that the incidence of tuberculous meningitis has decreased out of proportion to the decrease in other forms of tuberculosis following the vaccination of large segments of the population with BCG.

The onset is usually insidious; rarely fulminant. The patient complains of malaise, has low grade fever, variable headache. Eventually this progresses to pronounced lassitude and coma. At this point neurological examination reveals evidence of meningeal irritation plus palsies and abnormal reflexes which change rapidly both in intensity and location. Convulsions are frequent. Diagnosis rests on these observations coupled with knowledge of previous tuberculous infection as evidenced by positive reaction to tuberculin skin test or by clinical tuberculosis. The tuberculin skin test reaction is usually positive, but it may be negative during the early primary invasion or in the presence of overwhelming disease (the tuberculin reaction having been formerly positive.)

Results of blood studies are not remarkable except for the accelerated sedimentation rate observed in tuberculous infection. There are fewer cells in the cerebrospinal fluid—usually 200 to 300—than in the usual bacterial meningitis. At the onset there may be a preponderance of polymorphonuclear leukocytes, but as a rule most of the cells are mononuclear. A smear of the sediment will reveal tubercle bacilli in some instances, but more often the organisms are found in the coagulated protein or pellicle on the top of the tube. Culture on suitable media and guinea pig inoculation will aid in demonstration of the organisms. The chemical abnormalities in the fluid are of particular interest. As in other bacterial infections involving the cerebrospinal fluid, there is lowering of the sugar content—often of pronounced degree. This diminution in sugar content is felt to be caused by the metabolic activity of the infecting organisms. Concomitant reduction in chloride content is usually noted and cannot be explained on the same basis. Perhaps the so-called "blood-brain barrier" is altered, resulting in spinal fluid chloride values that approximate the 100 mEq. per liter normal of blood rather than the 120 mEq. per liter normal of cerebrospinal fluid. Cerebrospinal fluid chloride content less than 105 mEq. per liter or 600 mg. per 100 cc. should be considered almost diagnostic of tuberculous meningitis.[20] The cerebrospinal fluid protein content is increased. Sometimes there is pleocytosis without other evidence of infection. The disease in such cases is referred to as "serous" meningitis, for which the prognosis is much better than it is for the usual form of tuberculous meningitis. The cause may be a form of "neighborhood" reaction in which tuberculous foci lie adjacent to the meninges.

To date, the most successful antibiotic for tuberculous meningitis is streptomycin.[6, 7, 11, 22, 23, 24, 33] This must be given intramuscularly and intraspinally. Dosage schedules are shown in Table 4. Even though with this dosage—4 gm. a day for the average adult — there is a great risk of deafness and

TABLE 4.—*Therapy of Tuberculous Meningitis*
(Agents in order of preference)

Drug	Route	Initial Dose	Daily Dose	Level (Blood or serum)	Interval (Hours)	Duration (Months)
Streptomycin (Dihydro-)	Parenteral (Intramusc.) (Intraspinal)	15 mg./kg.	60+ mg./kg. 50 to 100 mg.	....	4 to 6 24	2 to 6 1 to 3
Promizole	Oral	.....	1 to 8 gm. Gradual increase	1 to 3 mg.%	6	12 to 36
Paramino-Salicylic Acid	Oral	.....	10 to 15 gm.	.....	6	12 to 36

ataxia, the high mortality rate if smaller amounts of the drug are used makes this risk necessary. Dihydrostreptomycin has largely supplanted streptomycin, but damage to the eighth nerve still occurs in a significant percentage of cases. Promizole, paramino salicylic acid[5, 6, 7, 11, 22, 23, 24, 33] and other agents are sometimes used in conjunction with streptomycin with apparent benefit. Supportive measures are as important in management of tuberculous meningitis as they are in tuberculous infection generally and should not be overlooked in the pursuance of antibiotic regimens. Lincoln[22] stressed that the disease may progress even to coma during treatment, yet the patient recover. Lincoln.[6, 7, 11, 22, 23, 24, 33] DeBré and others report arrest of tuberculous meningitis in children in from 40 per cent to 70 per cent of cases. Results with adults are far less encouraging.

Fungi and molds cause meningitis rarely. Clinically, disease of the meninges caused by these agents is much like tuberculous meningitis. All available antibiotics have been used in treatment, with variable but inconspicuous success.

Aseptic Meningitides

A large number of disease entities of varying etiologic delineation are included among the aseptic meningitides. The common denominator is spinal fluid pleocytosis, with the number of cells varying from a few to a thousand or more. No bacteria or other large organisms are demonstrable. Clinically there is evidence of meningeal irritation, but encephalitis and/or myelitis may also be present. The cells in the cerebrospinal fluid are usually predominantly mononuclear, but in some instances, notably in the presence of acute anterior poliomyelitis, the polymorphonuclear leukocytes may exceed the mononuclear cells. The highest cell counts in aseptic meningitides are observed in mumps meningitis, in which there may be over a thousand cells, 90 to 95 per cent of them mononuclear. Other viral diseases of this group include western and eastern equine encephalitis, St. Louis encephalitis, Japanese B encephalitis, measles meningoencephalitis, chickenpox meningoencephalitis, lymphocytic choriomeningitis. There are other conditions in the aseptic meningitides category, such as infectious mononucleosis, which are probably of viral origin. Confirmation of the diagnosis by culture of the virus in chick embryos or laboratory animals or by demonstration of a rise in specific antibody titer during the course of the disease may be possible in some instances.

Therapy in this group is largely symptomatic, although aureomycin has been tried (inconclusively) in the treatment of mumps meningitis.

It is important to note that purulent meningitides which have been reduced in severity by partial treatment may be mistaken for aseptic meningitides. Since therapy is dictated by exact diagnosis, careful differentiation is essential. All the suggested diagnostic aids previously referred to must be kept in mind in trying to determine the infectious agent. Perhaps the chick embryo culture is the most valuable of all in coaxing the infecting cocci or bacilli to grow luxuriantly enough to be identified.

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Cerebral Thrombosis and Embolism

A Method of Treatment

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SUMMARY

Acute cerebral thrombosis and embolism give rise to arterial spasm, edema, and anoxia of the cerebral tissues supplied by the affected artery or arteries. Sympathetic block induced by injecting the stellate ganglion with procaine appears to relieve spasm and results in improved cerebral circulation and clinical improvement in a significant number of cases. Sympathetic block should be combined with the usual supportive measures and not infrequently with anticoagulants. Every effort should be made to institute treatment as soon as possible after the onset of symptoms.

IN recent years there has developed a more dynamic approach to the treatment of acute cerebral thrombosis and embolism, due in large part to the increased interest and success in the treatment of peripheral vascular disease through the use of antispasmodic drugs, sympathetic block, and anticoagulants. While various investigators are in sharp disagreement as to the vasomotor reaction of the cerebral blood vessels even with sympathetic block, clinicians have generally accepted the occurrence of fleeting and reversible vascular phenomena as explanation of, for example, the manifestations of migraine and the rapid recovery from an apparently severe cerebrovascular lesion and from brain trauma.

It is the author's conception that intense vascular spasm, edema, and anoxia may result from an acute thrombotic lesion or embolism, which may be responsible for the majority of symptoms manifested by the patient. This concept is supported by the clinical work of Gilbert and de Takats[4] and by the experiments of Villaret and Cachera.[5] The latter investigators produced artificial cerebral embolism in dogs and watched the pial vessels through windows in the skull. Photographs demonstrated the occurrence of spasm of the pial vessels even in areas not directly affected by the embolus which at times persisted for weeks. The author therefore proposes a method of treatment of acute cerebral thrombosis or embolism which emphasizes the use of stellate block combined with the ordinary supportive measures and occasionally anticoagulants. This is largely based on work done on the neurologic service of the Los Angeles County General Hospital,[1] in which it was found that cerebral thrombosis and embolism responded equally well to this method of treatment. Similar results have been described previously by various investigators.[1,2,4]

Diagnosis is the point of beginning for determining the treatment to be used for any patient who has a cerebral vascular lesion. The criteria for the diagnosis of cerebral thrombosis, cerebral embolism, and cerebral hemorrhage are as follows:

Cerebral Thrombosis. It should be reiterated that the clinical manifestations in this condition are not solely the result of sudden occlusion of an artery but rather are due to a combination of vascular spasm and anoxia of the tissues involved, which may ultimately produce an area of softening without definite arterial occlusion.[3]

The patient is usually in advanced years, may or may not have cardiovascular renal disease, and often there is history of previous coronary thrombosis. Thrombosis may frequently develop in patients with a debilitating illness and occasionally will occur apparently simultaneously with acute coronary thrombosis. The onset of symptoms is gradual; thrombosis usually develops during the rest, and ordinarily is not accompanied by unconsciousness, although confusion and stupor may appear. Occasionally there may be a series of premonitory symptoms such as numbness, weakness, or even language disturbance, which subside after a few hours only to recur, until finally they become permanent. Spinal fluid examination is essential. Usually no increase in pressure is observed, although there are a few exceptions, and the fluid is clear, with no significant change in cell count or total protein.

Cerebral Embolism. This diagnosis is made when a patient with a sudden cerebral insult has a cardiac or vascular lesion which can be a source for the embolus or has embolic phenomena elsewhere in the body. Typically, there is unconsciousness, with clinical evidence of a severe intracerebral lesion. The spinal fluid is clear, under no increase in pressure, and shows no change in cell count or total protein content.

Cerebral Hemorrhage. This condition usually appears in persons who have hypertension but who have not had much cardiac damage therefrom. They are younger than those in whom cerebral thrombosis occurs. Symptoms usually develop during stress. They are abrupt in onset and coma usually develops rapidly. At this point the blood pressure

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may have fallen, so that it is within normal limits. Accurate diagnosis, again, depends on the history of onset, the clinical findings, and spinal fluid examination which frequently shows increased pressure (over 160 mm. of water) and, in the majority of cases, blood-tinged fluid.

Once the diagnosis of cerebral thrombosis or embolism has been established, treatment should be started promptly. In the author's experience, stellate block produced on the side of the lesion within six hours after the onset of symptoms gives the most satisfactory results. Often within a few minutes after the injection is completed the patient notices and demonstrates increased motor function in the affected limb or limbs. If he has any speech disturbance it may be improved, and often he appears more alert mentally. Of ten patients treated at the Los Angeles County General Hospital within the first six hours after the development of symptoms, nine showed definite improvement.[1] This procedure should be repeated daily for about four days if the improvement noted after the first block is not sustained.

The stellate ganglion lies near the junction of the body and the transverse process of the seventh cervical vertebra. The sympathetic nerve supply to the cerebral vessels is carried upward to the carotid plexus by way of the stellate ganglion. Therefore, blocking of this ganglion with procaine will deprive the cerebral vessels of their sympathetic nerve control and result in vasodilatation. Block may be successfully and safely produced by the anterior approach.

At a point about 2 inches superior to the sternal notch, just lateral to the trachea and medial to the great vessels and the inner border of the sternocleidomastoid muscle, a dermal wheal is made with 1 per cent aqueous procaine, and a 22-gauge needle, without stilette, is inserted close to the edge of the trachea. The great vessels of the neck are retracted with the other hand. The needle is directed posteriorly, perpendicular to the vertical axis of the vertebral column. The area to be infiltrated is near the lateral aspect of the seventh cervical vertebra. After bone is reached aspiration is performed to determine whether any blood vessels, the lung, or the spinal canal have been punctured. Ten cc. of 2 per cent procaine is then injected and, if the procedure is successful, Horner's syndrome will appear within 20 minutes. If Horner's syndrome does not develop, the injection should be repeated.

In addition to stellate block, general supportive measures should be instituted as indicated. To insure as adequate cerebral circulation as possible, patients should be given oxygen if there is any respiratory embarrassment or cyanosis. Mucus should be aspirated and the foot of the bed elevated, especially for the patient with thrombosis. Adequate fluid intake (3,000 to 4,000 cc. daily) should be maintained, using the intravenous method if the patient is unable to take fluids orally. Nicotinic acid in doses of 50 to 100 mg. three times daily is given for its vasodilating effect. The author has had no experience with benzazoline hydrochloride.

If the patient remains unconscious more than 48 hours, nutrition should be supplied by tube feedings. Sedation should be used sparingly—in amounts sufficient to produce the desired effect without deep narcosis. Pentobarbital in doses of 0.1 to 0.2 gm. is usually adequate. If the patient is unable to take medication orally, pentobarbital may be given rectally or sodium phenobarbital may be administered hypodermically. Urinary incontinence or retention should be treated according to present-day urologic principles.

Anticoagulants may be used in conjunction with stellate block, or alone in certain instances in which block appears to be ineffective or not indicated. Gilbert and de Takats[4] recommended the use of anticoagulants in conjunction with stellate block in cerebral embolism. When there is progression of symptoms in spite of stellate block and supportive measures, especially if the lesion is on the major side and causing some disturbance of language, use of anticoagulants is imperative. In an occasional case there occur episodes indicating some cerebral circulatory disturbance from which the patient recovers in a few hours only to have recurrence in a few days. This cycle is repeated at intervals until recovery is incomplete. In such circumstances, the author has obtained excellent results from the use of Dicumarol.®

Intravenous administration of procaine, using 0.5 gm. to 1.0 gm. in 500 cc. of saline solution, can be utilized if stellate block is not available. While it does seem to be beneficial in some cases, the results are not comparable with those obtained with stellate block.

Treatment as outlined in this presentation, especially as regards the use of anticoagulants, should be followed only in cases in which the diagnosis of cerebral thrombosis or embolism is certain. If cerebral hemorrhage cannot be definitely ruled out, general measures only should be used. While the best results appear to be obtained when treatment is instituted early, not infrequently improvement is obtained in cases in which the lesion is several days old. This is especially true if the patient is young.

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The Conservative Treatment of Myasthenia Gravis

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SUMMARY

Neostigmine is at present the mainstay in treatment of myasthenia gravis. Adjuvant therapy with ephedrine, potassium chloride, or guanidine is recommended. Urecholine,® also used as an adjuvant, is still in the experimental stage and should only be given by one acquainted with its properties and toxic effects. Di-isopropylfluorophosphate and tetraethyl pyrophosphate likewise are still in the experimental stage. Since they are extremely toxic and unstable, general use of them is discouraged until further experimental and therapeutic studies are completed. The results of thymectomy and radiation of the thymus are equivocal and these procedures should be reserved for severe cases which should be selected only after a thorough study.

THE modern treatment of myasthenia gravis is based on knowledge of the synaptic transmission of motor impulses at the myoneural junction by acetylcholine. Since Walker's discovery that physostigmine and neostigmine improved the symptoms of myasthenia, it has been assumed that this disease might be explained in terms of curarizing effect.[22,23] Curare and quinine exaggerate the symptoms of myasthenia gravis.[1,10] On the other hand, drugs which inhibit the enzyme cholinesterase and which therefore serve to protect acetylcholine are beneficial in myasthenia gravis. These facts have lent credence to the theory of curarizing effect. The precise reason for the failure of synaptic transmission, however, remains obscure.

More recent evidence has suggested that myasthenia is caused by a deficiency of acetylcholine, that is, by "cholinergic insufficiency."[3,12] Treatment today is based on the concept that the disease is caused either by curarizing effect or by cholinergic insufficiency, with the additional postulation that one or the other of these theoretical causes might stem from thymic or endocrine disturbances.

The drugs which act as cholinesterase inhibitors (decurarizing effect) are prostigmine bromide, neostigmine (prostigmine methylsulfate), potassium chloride, ephedrine sulfate, and guanidine.[7,14,19,20]

Neostigmine is the most effective drug in the therapy of myasthenia gravis and, because it is also relatively non-toxic and safe, is the drug of choice. The dosage may vary from 15 to 30 mg. (one or two tablets) two or three times daily, in mild cases, to as high as 30 mg. six times daily in more severe cases.[21] If the patient has difficulty starting oral medication in the morning or tends to choke with eating, a combination of oral and parenteral administration may prove of value. In this case, the usual oral dose should be supplemented with 0.5 to 1.0 mg. of neostigmine given intramuscularly in the morning and one hour before meals.[20] In severe cases, intramuscular administration may have to be relied upon. The dosage may vary from 0.5 to 2.5 mg. of neostigmine as required. Parenteral doses as high as 1.5 mg. hourly have been reported.[20] The emergency treatment of myasthenia in severe exacerbations consists of 1 to 2 mg. neostigmine given intravenously. The intelligent patient, under supervision of a physician, will soon learn to vary the dosage, both oral and parenteral, according to the severity of symptoms. The undesirable gastrointestinal side-effects of neostigmine are adequately controlled by atropine sulfate. In mild cases tincture of belladonna gives good results.[9] In more severe cases, where parenteral administration of neostigmine is required, atropine sulfate (0.6 mg.) should accompany the neostigmine injection.

As neostigmine is an agent of transient action, adjuvants are required to prolong its effect. Ephedrine, potassium, and guanidine are useful in this connection. Ephedrine sulfate, in doses of from 8.0 to 24.0 mg. two or three times daily, is recommended.[8] Potassium chloride must be given in doses of from 4 to 6 gm. six times a day.[14] The gastrointestinal and urinary side-effects of potassium therapy may be reduced if it is taken in specially prepared eggnogs, orange juice, or tomato juice.[19] The results of guanidine therapy have been equivocal. The usual recommended dose is from 10 to 25 mg. per kilogram of body weight, but in severe cases from 20 to 50 mg. per kilogram of body weight daily, administered in three divided doses. may be necessary.[7,15]

In addition to such drugs, certain general therapeutic measures should be emphasized. The avoidance of fatigue must be stressed, and reassurance is constantly necessary. Physiotherapy, narcotics, anesthetics, quinine, curare, and desiccated thyroid should be avoided since they may exaggerate the myasthenic condition. During exacerbations careful nursing attention is necessary.

Two new agents, di-isopropylfluorophosphate and tetraethyl pyrophosphate, are being used experimentally.[6,18] Presumably the potent toxic effect of fluorine on enzyme systems inactivates cholinesterase.[6] Preliminary clinical reports of di-isopropylfluorophosphate and tetraethyl pyrophosphate indicate good clinical results. Tetraethyl pyrophosphate is the least toxic, but the margin between the effective

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dose and the dangerous dose is narrow; and it is not as potent an inhibitor of cholinesterase as is neostigmine. More prolonged action is its chief attribute. Convulsions and gastrointestinal symptoms are the most frequent symptoms of intoxication from use of these two drugs. Both are extremely unstable in the presence of water, and dosage is difficult to maintain.[16] Consequently, di-isopropyl-fluorophosphate and tetraethyl pyrophosphate need further experimental and therapeutic studies before they may be considered reliable and safe.

A few words with respect to cholinergic-stimulating therapy in myasthenia therapy may be in order. Urecholine®* (B methylcholine urethane), which has a parasympathetic-like action, was suggested to the authors as an adjuvant in myasthenia gravis. This drug is stable and has a prolonged action in producing nicotine-like effects.[17] It is less toxic than other choline derivatives. Electromyographic studies following subcutaneous injection of Urecholine (0.5 mg.) in patients with myasthenia showed an increase in muscle action potentials similar to those observed after neostigmine. Although the observed response was weaker than the response obtained with neostigmine, it was more prolonged, which suggests that Urecholine may be a useful adjuvant to neostigmine therapy in myasthenia gravis. Clinical studies of the drug which are being made by the authors are still in an initial phase, however, and results thus far do not permit an evaluation of the usefulness of this agent in myasthenia gravis.

A review of the therapy of myasthenia gravis would not be complete without some mention of the recent studies on the thymus gland. Treatment of the thymus has involved two approaches, radiation and operation. The presence of a thymic tumor, as demonstrated by x-ray in patients with myasthenia gravis, by no means justifies thymectomy. The results of thymectomy have been variable, and since spontaneous remission occurs in approximately 25 per cent of myasthenic patients, the results of thymectomy are difficult to evaluate.[11] In addition, it must be remembered that the estimated mortality of thymectomy is from 20 to 25 per cent and that only some 25 or 30 per cent of myasthenic patients are suitable subjects for the operation. Thus, thymectomy is not only hazardous,[13] but its effects are equivocal. The recent reports of Clagget and Eaton,[5] Blalock,[2] Keynes,[13] Harvey,[11] and Castleman and Norris[4] lead to the conclusion that final evaluation of thymectomy in myasthenia gravis will require further study. The results of radiation therapy on the thymus gland have also been equivocal.

*Supplied through the courtesy of Merck & Co.

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Spontaneous Subarachnoid Hemorrhage

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SUMMARY

Sudden development of pain in the head followed by evidences of meningeal irritation, with or without motor or sensory symptoms or signs, is almost pathognomonic of subarachnoid hemorrhage. The final diagnosis rests upon the demonstration of blood in the cerebrospinal fluid. If the hemorrhage is massive, or from an aneurysm of an unprotected arterial trunk, the patient may die in a comparatively short time. If the bleeding is less abundant and from an aneurysm which is protected by adjacent structures the patient may survive. Angiography should probably be done early in most cases. If neurological signs or the results of angiography indicate that the aneurysm is in such a location that surgical treatment is feasible it should probably be undertaken. If medical treatment is to be carried out the patient should have protracted rest, frequent spinal drainage so long as the cerebrospinal fluid contains blood or is under materially increased pressure, sedatives and analgesics, and passive movements of the neck and limbs to forestall limitation of motion of joints.

SPONTANEOUS subarachnoid hemorrhage is a non-traumatic extravasation of blood into the subarachnoid space, the area between the pia mater and the arachnoid which is normally filled with cerebrospinal fluid. For more than a quarter of a century it has been recognized that in most cases hemorrhage of this sort is due to rupture of an aneurysm of the circle of Willis. In addition, certain systemic infections and dyscrasias of the blood, as well as arteriosclerosis, rare vascular anomalies and hemangiomatous tumors of the brain may result in bleeding into the subarachnoid space.

CAUSATIVE FACTORS

Aneurysms of the arteries of the brain are more common than those in other vessels. True aneurysms, however, are not often seen in the brain itself but tend to involve the arteries of the base before they or their branches enter the brain. The internal carotid artery and its terminal anterior cerebral and middle cerebral arteries are particularly likely to show aneurysmal dilatation.

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The most important factors in the causation of cerebral aneurysms are, in order of ascending importance, infection, arteriosclerosis, and inherent weakness of the walls of the arteries which form the circle of Willis or of the larger branches of those arteries. In turn, intracranial aneurysms may be divided logically into three groups, the mycotic or embolic, the arteriosclerotic or fusiform and the saccular or "berry" type. In Dandy's[3] series of 108 cases 4.5 per cent were of mycotic nature. In such cases there is usually a history of antecedent subacute bacterial endocarditis, pyemia, or purulent disease of the lungs. Rupture of an aneurysm of this type is usually a terminal development. The arteriosclerotic or fusiform aneurysms tend to involve the larger arterial trunks, particularly the basilar and vertebral arteries. In Dandy's series, 22 of the cases (16.2 per cent) were of that classification. In most of the cases in that group the diagnosis was made at operation or necropsy. The saccular or "berry" type of aneurysm is commonly agreed to be due to congenital defects. It was first described by Virchow, was called "miliary" aneurysm by Charcot, and "berry" aneurysm by Richardson and Hyland.[7]

EMBRYOLOGY

Forbus[4] described a muscular defect of the media at points of bifurcation, not only in the arteries of the brain, with and without aneurysmal formation, but in arteries elsewhere in the body. The defect was so commonly encountered as to indicate that it is relatively normal. It was possible to show that these muscular defects began in embryonic life. From study of the time and mode of development of the muscular coat of arteries, Forbus arrived at a theoretic explanation of the failure of muscular development at points of bifurcation. The muscular coat of any vessel develops at an earlier period than that of its branches, from a group of mesenchymal cells, separate and distinct from those forming the muscularis of the branches. A failure of the two separately developing muscular coats to fuse properly offers a possible explanation of the later observed defects. Forbus concluded that miliary aneurysms of the superficial cerebral arteries and most probably those of all arteries of medium size, occur quite independently of any inflammatory process, arteriosclerosis or external trauma, and that these aneurysms as such are not congenital malformations but are acquired lesions arising from a combination of focal weakness (the result of a congenital defect of the muscularis) with degeneration of the internal elastic membrane due to continued over-stretching of this structure.

Dandy[3] and a co-worker (Dorcas Hager) concluded from a study of the material of the Carnegie Embryological Collection that the adult pattern of

the circle of Willis may be recognized as early as the second embryonic month, and that the early process of development of this structure is characterized not by the outgrowth of definitive vessels as such but by the elaboration of certain channels and the total disappearance of others in "an all embracing primitive plexus." From their work it would appear that as arterial trunks are developed from this primitive capillary network, numerous vessels are absorbed. The sites of absorption of these vessels are believed to represent weak points from which miliary or "berry" aneurysms arise. This hypothesis would explain the development of an aneurysmal sac with a narrow neck as the result of the incomplete disappearance of one of these vessels. The residual tiny protrusions which are present at birth apparently slowly increase in size with age. It is noteworthy that many of the aneurysms of the internal carotid artery within the cranial chamber arise where there are no branches and at points where primitive vessels were absorbed. The aneurysms of the anterior communicating artery frequently arise from the site of origin of the primitive median anterior cerebral artery. Syphilis plays little, if any, part in the formation of these aneurysms.

AUTOPSY DATA

In the course of a review of the results of 30,000 autopsies, Courville[2] encountered 96 aneurysms of the circle of Willis. Eighty-three of them were of the saccular or berry type. Thirty involved the anterior cerebral and anterior communicating arteries, 22 were at the point of bifurcation of the internal carotid into the anterior and middle cerebral arteries, 26 at bifurcations of the middle cerebral arteries, one at the junction of the posterior cerebral and posterior communicating arteries, and four at the bifurcation of the basilar artery to form the posterior cerebral arteries.

In size saccular aneurysms vary from a few millimeters to as much as 5 cm. in diameter. The walls may be the thickness of the parent vessel or may be as thin as tissue paper. Multiple aneurysms are not uncommon. Dandy reported one patient with five aneurysms. In general they are somewhat more common in females than in males. Symptoms have been noted in patients younger than two years of age[3] and older than 70.

SYMPTOMS

In some instances there are prodromal symptoms. Sudden repeated sharp pains in the eyes or in the frontal or temporal region followed by ptosis of an upper eyelid and extraocular palsies are almost pathognomonic of carotid aneurysms. A suspicion of rupture of a congenital aneurysm of the circle of Willis should arise whenever sudden symptoms of intracranial origin develop. The diagnosis is established if the cerebrospinal fluid is bloody or yellow.

An aneurysm of an artery of the brain, however, may give rise to no symptoms until the moment of rupture. At that time the patient may speak of "something snapping in the head."[1] This is associated with or followed by pain of great severity which may radiate to the frontal region, or may be referred to the occipitonuchal region. Subarachnoid hemorrhage is usually slow, but may be rapid in onset and may lead to violent symptoms such as falling, loss of consciousness, deep coma, generalized convulsions, cranial nerve palsies, partial or complete paralysis, slowing of the pulse rate, elevation of temperature and death. If the initial hemorrhage is massive or from an unprotected arterial trunk, death may result within a matter of hours. In other cases bleeding may recur at intervals for hours or days in smaller amounts.

Anteriorly placed aneurysms may compress the optic nerve with unilateral diminution in the acuity of vision. Sometimes an optic tract is compressed, resulting in a hemianopic defect. An aneurysm of the middle cerebral artery may lead to monoplegia or hemiplegia. Aneurysms of the posterior communicating artery are particularly likely to be associated with oculomotor or third nerve palsy and possibly hemianopia due to compression of the corresponding optic tract. Aneurysms of the basilar artery may result in paralysis on both sides or be characterized by alternating hemiplegia.

If daily lumbar puncture is practiced it will be observed that the supernatant fluid, which at first is usually deep red, becomes yellow in three or four days. Erythrocytes in appreciable number give a cloudy appearance to the cerebrospinal fluid. The cloudiness diminishes as the blood is hemolyzed, provided no further bleeding occurs. For several weeks after the initial hemorrhage, erythrocytes in diminishing number may continue to be present in the cerebrospinal fluid. As a result of the irritation of the leptomeninges by the blood, residual pleocytosis which is chiefly of mononuclear type frequently develops. There may be a few polymorphonuclear cells. So long as blood is present, and sometimes for rather long periods afterward, the cerebrospinal fluid is liable to be under materially increased pressure. Pressures as high as 300 to 400 mm. of water are frequently encountered. The total protein content of the fluid is elevated. In one case observed by the author, 180 mg. per 100 cc. was recorded, but as a rule the total protein content does not exceed 100 mg. per 100 cc.

Hemiplegia or hemiparesis is a relatively common finding and is most commonly encountered in aneurysms involving the middle cerebral artery. Persistent loss of motor function may be due to associated cerebral thrombosis or to local pressure from an aneurysm. Transient symptoms of paralytic nature may be due to cerebral edema or to the formation of a hematoma. The presence of monoplegia restricted to a lower limb is presumptive evidence of involvement of an anterior cerebral artery. Loss of power on both sides usually may be taken as evidence of basilar or vertebral arterial involvement. Babinski's sign is of value when it is unilateral. When it is bilateral it is probably due to the irritating effect of blood over the convexity of the cerebrum.

Convulsive seizures occurred in 20 per cent of Dandy's cases.[3] Focal seizures are more common where there is involvement of the anterior or middle cerebral arteries. Papilledema is occasionally encountered. Subhyaloid hemorrhage following episodes of abrupt loss of consciousness is often of great diagnostic significance. It is due to extension of the hemorrhage along the subarachnoid sheaths of the optic nerves.

ROENTGENOGRAPHY

Occasionally evidence obtained by roentgenographic examination of the skull is of great diagnostic value,[6,9] particularly where aneurysms involve the vessels of the anterior part of the circle of Willis. Recognition of an aneurysm on this basis rests upon the discovery of evidence of calcification in the walls of the aneurysm or erosion of bone adjacent to the aneurysmal sac. In the first instance there are plaques of calcium beside the sella turcica which are generally semilunar in shape with the convexity upward. These appear as fine, curvilinear shadows, sharply outlined, occasionally segmented and easily recognizable as lying in the wall of a cystic or rounded structure. As a rule, however, the diagnosis and localization of an aneurysm is possible only in cases in which there is intermittent leakage and focal signs, or in instances in which aneurysms have been demonstrated by angiographic studies.

ANGIOGRAPHY

The introduction of angiography by Moniz in 1927 opened new avenues of diagnostic thought. In 1933 Moniz[3] localized an aneurysm by this method. Since that time angiography has been employed to an increasing degree as an aid to diagnosis where variations from the normal cerebrovascular pattern have been considered reasonable possibilities. While carotid angiography is generally the method of choice, vertebral angiography must sometimes be performed if evidence of involvement of the posterior communicating or the posterior cerebral arteries is to be demonstrated. Dandy was of the opinion that this procedure was generally unnecessary since it was usually possible to postulate with reasonable accuracy the side on which the lesion is located. Since most aneurysms involve the carotid trunks or their terminal anterior and middle cerebral arteries, he felt surgical exploration justifiable without the added risk of angiography.

Ventriculography is of no diagnostic value except in those instances in which the aneurysm is very large and is producing symptoms by pressure on adjacent structures.[3]

TREATMENT

The problem of treatment has received a great deal of consideration. Symonds[12] recommended daily spinal puncture. Others have looked with disfavor on this procedure. It is the author's opinion that so long as the cerebrospinal fluid contains blood and the pressure is significantly elevated, frequent spinal drainage should be carried out. In several instances in which bradycardia was present the pulse rate became normal after reduction of the pressure from 350 or 450 mm. of water to 100 mm. or less. Absolute rest in bed for a long period is mandatory. It has been the author's practice to limit the intake of fluids rather sharply, to put the patient on an acid-ash diet in order to facilitate elimination of calcium, to give small amounts of phenobarbital several times daily as a sedative and to relieve pain by morphine or other appropriate analgesic medication. Very often the inhalation of oxygen will relieve a headache and partially clear the sensorium. It is imperative that the patient be able to have a bowel movement daily without the necessity of straining. Mild catharsis or enemas are generally effective. In one case large doses of fluid extract of cascara were required. Passive movement of the neck and limbs should be carried out to forestall limitation of motion of joints.

NEUROSURGICAL TREATMENT

There is considerable divergence of opinion as to the indications for neurosurgical treatment. Richardson and Hyland[7] recommended that surgical efforts be restricted to larger aneurysms causing focal symptoms. Dandy,[3] on the other hand, was of the opinion that surgical intervention was highly desirable in view of the high mortality rate associated with the first subarachnoid hemorrhage and of the frequent recurrences. For lesions in the cranial chamber or in the cavernous sinus he recommended occlusion of the internal carotid, provided Matas' tests of partial and later complete occlusion of the ipsilateral internal carotid artery did not lead to serious symptoms of cerebral anemia. Hamby expressed preference for contralateral common carotid occlusion as a test for the efficiency of the collateral circulation of the circle of Willis. If both of these tests give satisfactory results, the common or the internal carotid artery may be occluded by fascial strips, plication or tantalum clips. Hamby believed that it is safer to occlude the artery of choice partially for seven to ten days and then to make the occlusion complete. If an aneurysm has a neck, it may be clipped intracranially. The mortality rate for intracranial operation on aneurysms of the circle of Willis, however, is 25 per cent. Surgical treatment of aneurysms of the middle cerebral and anterior communicating arteries is extremely hazardous. In three cases upon which Hamby operated, bilateral closure of the anterior cerebral arteries was necessary. Of these patients, two died and the third became "paralytic and practically amental."

With conservative treatment healing is brought about by the formation of a clot in the region of the aperture in the vessel. At times the thrombosis may be propagated to such an extent that occlusion of the parent vessel occurs resulting in symptoms referable to the anterior, middle or posterior cerebral arteries. In one case observed by the author, this

process resulted in the development of right hemiparesis and of a considerable degree of aphasia in a patient in whom paralysis of the left oculomotor nerve was manifest at the time of onset of symptoms.

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Evaluation of Therapy of Peripheral Polyneuritis

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SUMMARY

Peripheral polyneuritis is not a disease entity but a mystery. The underlying cause should be searched for, but since often it cannot be found, treatment should be started simultaneously with the search. Conservative measures should be tried first—vitamin B complex, niacin, riboflavin, pyridoxine and thiamine chloride; next, injections of liver extract. Then, if no specific condition amenable to treatment has been discovered and if the patient is seriously incapacitated and becoming worse, hospitalization for trial with BAL is indicated.

PERIPHERAL polyneuritis is not a disease entity but a syndrome in which the longest neurons in the body are bilaterally, symmetrically affected. It may be due to countless conditions. The effect may be motor, with weakness of the hands and legs, or sensory with glove-and-stocking impairment. Most often it is mixed, both motor and sensory.

The most interesting advance in therapy is the treatment with BAL (2, 3-dimercaptopropanol). This has been found successful not only in cases due to arsenic poisoning, but also in those due to infection or vitamin deficiency.

BAL was developed experimentally as an antidote to arsenic poisoning. The mechanism is as follows: Certain enzymes, including the pyruvate oxidase system, function through their sulfhydryl groups. In arsenic poisoning the arsenic combines with these sulfhydryl groups, making the enzyme inactive. Inactive enzymes disrupt metabolism, and the patient gets sick. BAL has sulfhydryl groups which possess a greater affinity for arsenic than do the sulfhydryl groups contained in enzymes. Therefore, in the presence of BAL, arsenic becomes dissociated from the enzymes to unite with the BAL. The enzymes are liberated. There is renewal of enzyme activity and resumption of metabolic function. The patient improves. The compound formed by the BAL-arsenic combination, BALthioarsenite, is chemically stable, harmless and rapidly excreted by the patient.

BAL is efficacious in the treatment of intoxication with certain heavy metals—arsenic, mercury, gold and antimony. But it is contraindicated for lead neuritis and in cadmium disease. The BAL-lead and BAL-cadmium compounds are more toxic than either lead or cadmium alone.

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BAL is useful in heavy metal poisoning because it reactivates the enzyme equilibrium. On the theory that peripheral polyneuritis resulting from causes other than heavy metal intoxication also may be due to disruption of enzyme equilibrium. Nielsen[2] recommended trial of BAL in cases of peripheral polyneuritis which did not respond to other measures. Treatment with BAL was given at Birmingham Hospital in 1948 by Furmanski,[1] at the Los Angeles County General Hospital, and by Nielsen in private practice. In several instances results were striking. Patients whose condition was getting worse despite administration of large doses of liver extract and vitamins began to improve within a few days of the administration of BAL, and later became ambulatory. In these cases the peripheral polyneuritis was associated with virus infection, and with non-specific anemia and with alcoholism and/or avitaminosis. In all instances symptoms were of recent onset. Therapy is of benefit only when the metabolic disturbance is reversible. With continued disease of the nervous system there is progressive demyelinization of the nerves. Eventually no treatment cures.

A syndrome which may be confused with peripheral polyneuritis and which also in the early stages may be amenable to BAL therapy is infectious neuronitis, or the Guillain-Barré syndrome. The patient may have signs of peripheral neuritis; signs of transverse myelitis, with Babinski reaction or inability to void urine; and signs simulating those of anterior poliomyelitis, along with facial or other cranial nerve paralysis. Diagnosis is simplified if suspicion of neuronitis is aroused by acute onset suggestive of virus infection, and by an increase in protein but a low cell count in the spinal fluid. If the patient does not die of the disease—the death rate is about 20 per cent—prognosis for return of function is good. In some cases BAL has proved amazingly effective, in others ineffective.

BAL is available in 10 per cent solution in 20 per cent benzylbenzoate in peanut oil. It should be injected deep into the muscle. Dosage varies with the condition and with the patient. In peripheral polyneuritis 2.5 mg. per kilogram of body weight should be given every six hours. The length of treatment depends on the response of the patient. Occasionally treatment has to be discontinued because of extreme soreness of the gluteal muscles, cold abscesses, vomiting or untoward consequences such as bulbar paralysis. BAL is a potentially hazardous drug. Use of it is indicated in cases of heavy metal poisoning and possibly in fulminating infectious disease of the nervous system. In other cases it should not be used unless conservative measures have proved futile.

Conservative measures include the use of vita-

min B. This certainly should be tried first, particularly in cases in which there is history of vitamin deficiency or in which associated physical findings are suggestive of it. According to Strauss,[3] Wintrobe produced peripheral polyneuritis experimentally with diets adequate in thiamine chloride but deficient in the other vitamin B components. Therefore in the treatment of peripheral polyneuritis all the vitamin B complex should be given—crude vitamin B supplemented by riboflavin, pyridoxine and nicotinic acid as well as thiamine chloride.

Injections of liver extract often have proved helpful even when there was no demonstrable anemia. Patients should receive therapeutic trial with both crude and pure liver extract in massive doses.

The general care of the patient is important: The feet should be splinted to avoid foot drop. During the early irritative stage a cradle should be placed over the limbs to protect them from the irritation of bedclothes, which may cause intolerable pain. Gentle heat may afford relief. Decubitus ulcers should be prevented by judicious padding and frequent changes of position. The patient should be kept clean, dry, comfortable and happy—quite an undertaking if the disease is extensive, with paralysis of the arms as well as of the legs. After the irritative stage is over, light massage and gentle exercise of the affected parts may be instituted and then cautiously increased. Anything that is painful to the patient is contraindicated. Increase of pain is a sign that either the patient or the physiotherapist is doing too much, and that the activity must be reduced or temporarily discontinued. When the patient at last becomes ambulatory he should wear arch supports, since the small muscles of the foot are the last to regain function.

Physical therapy is exceedingly valuable and should be administered by a trained physical therapist. It hastens rehabilitation after an acute episode, and it is the only measure which may help the patient with long-standing peripheral polyneuritis.

Peripheral polyneuritis may be the first manifestation of any of a number of diseases. Therefore, if the cause is not apparent, the temptation to diagnose avitaminosis should be resisted. Instead, careful search for a cause should be made. The possibility of pernicious anemia should be investigated. Blood examination, gastric analysis and therapeutic trial with liver extract should be carried out in cases in which the cause is obscure. In patients with known pernicious anemia the number of erythrocytes per cu. mm. should be kept over six million if possible in order to prevent central nervous system complications.

Next, diabetes must be considered. Central nervous system disease tends to occur in association with low grade diabetes that is fairly well controlled without insulin. The onset of peripheral polyneuritis may be the first sign of the disease; in a patient known to have diabetes, it may be the signal for more strenuous treatment of that condition.

Hematoporphyrinuria is another condition often associated with peripheral polyneuritis. A 24-hour specimen of urine should be examined for porphyrin bodies. The presence of porphyrin signifies a metabolic disturbance. When this is due to liver dysfunction the patient may be helped by nicotinic acid in doses of at least 50 mg. per day.

Other conditions causing peripheral polyneuritis include hypoglycemia, hyperthyroidism, chronic gastrointestinal or liver disease, acute and chronic febrile illness, diphtheria, leprosy, Boeck's sarcoid disease, parasite infestation, periarteritis nodosa, peripheral vascular disease and malignant neoplasms. These all should be at least considered.

Finally, the possibility of chronic or acute poisoning must be investigated. Considerations in this regard are the medication the patient is taking, arsenic poisoning from the careless use of ant powder or the consumption of unwashed previously sprayed fruit and vegetables, carbon monoxide poisoning, triorthocresyl phosphate contamination of liquor (as a cause of so-called "jake" paralysis) or possibly of cooking oils. (The contamination of cooking oils has been reported in other countries but to date not in the United States.) Also to be considered is absorption of noxious chemicals by inhalation or percutaneous route from insect sprays, dyes, cleaning fluids and similar volatile compounds at home or at work.

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The Contribution of Cerebral Angiography in Diagnosis

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SUMMARY

Angiography is important in the diagnosis of central nervous system disorders. In operable lesions it not only discloses the location of the lesion but also gives valuable information regarding its character and surrounding vascular architecture.

The technique of both the pericutaneous and the open methods is described. The advantages of the controlled automatic arteriograph are described as well as pertinent information regarding cerebral circulation time.

The choice of contrast media and the advantages and disadvantages of each are described.

The three phases of angiography important in diagnosis—the arterial phase, the capillary phase and the venous phase—are discussed.

The indications and contraindications are briefly outlined with respect to neoplasms, trauma, hemorrhage, aneurysms and other such operable lesions.

The characteristic changes produced by aneurysms, vascular malformations, neoplasms and other space-occupying lesions as related to the circulatory apparatus show variations characterizing the type of lesion encountered.

Angiography in traumatic conditions, while limited, is of exceptional value in the diagnosis of obscure lesions, particularly the subdural hematomas.

THE importance of angiography in the diagnosis of central nervous system disorders cannot be overemphasized. While it does not in any way replace a thorough neurological examination, it does serve as a valuable supplement. Actually, it may be more informative than pneumoencephalography or ventriculography.

By its use, the vascular architecture and often the pathologic character of operable lesions can be determined before surgical intervention. Such information is of the greatest importance in the plans of a successful operation. It is perhaps the only positive method for differentiating between the types of progressive cerebrovascular disease and expanding lesions. Other more obscure lesions, such as aneurysms, arteriovenous complexes, and telangiectases, often cannot otherwise be positively identified.

The gravity of the situation demanding angiography is invariably greater by far than the small risk involved. While the procedure has been slow in gaining popularity, it now ranks with the most important supplementary aids in neurologic diagnosis.

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HISTORY

In 1927 Moniz and Tima established the diagnosis of a temporal lobe tumor in a cadaver by injecting radiopaque material into the carotid artery. They found that a solution of sodium iodide gave good contrast pictures and could be injected so as to visualize cerebral vessels with reasonable safety. Subsequently the procedure became routine in their clinic in suitable cases. The speed of blood flow through the brain was studied. The characteristic difference in the angiographic pattern between meningioma and astrocytoma was established. Changes resulting from trauma, especially subdural hematoma, were reported. Tonnis pointed out the differentiating feature of glioblastoma multiforme and cerebral abscess. Dyes and Fisher elaborated on tumor localization by angiography. Lorenz attempted to classify tumors on the basis of their angiographic pattern (cited by Engset).[6]

Saccular aneurysms were described by Hermann,[10] Dott,[2, 3, 4] and Jefferson.[11, 12, 13] Details of a vascular malformation were reported by Bergstrand, Olivecrona and Tonnis (cited by Engset).[6] In more recent years List,[14, 15, 16, 17] Gross,[8, 9] Poppen,[21] Norlen,[19] Elvidge,[5] Culbreth,[1] Gass,[7] and others have stressed the value of angiography in surgical lesions. These contributions, among others of equal and supplemental importance, have established angiography as another indispensable method of studying diseases of the central nervous system.

TECHNIQUE

As in all roentgenographic studies, good films are essential. Since rapidly moving dye in the cerebral circulations must be photographed, proper equipment and an experienced team are required. Three phases of the circulation are important—the arterial phase, the capillary phase, and the venous phase. The average length of time for blood to travel from the carotid artery in the neck through the brain and back to the jugular vein in the neck is 4.5 seconds. Therefore, a series of films must be exposed during this period of time.

The authors use an automatic film changer which furnishes six exposures in 4.5 seconds.[22] This gives a complete picture of the cerebral circulatory apparatus as well as an evaluation of the circulation

time. Thus alterations of the circulatory mechanism which occur in disease can readily be visualized. Since the blood in the carotid artery moves rapidly, the dye should be injected in a single burst through a 17-gauge needle. Film exposure must be started as the last of the dye leaves the needle. This gives proper timing of films, and 8 cc. of dye when injected rapidly gives adequate concentration in all parts of the vascular system. Anteroposterior and lateral exposures are usually sufficient. Occasionally an oblique view may be desirable and this can be determined by studying the wet films before removing the needle from the artery.

The choice of dye has been the subject of considerable controversy. In this country Thorotrast® and Diodrast® are the most commonly employed. Thorotrast is the least irritating, gives the best pictures, and therefore enjoys the greater popularity. However, it is objected to by a few on the ground that it is radioactive.[18, 20, 23, 24] After injection it is finally deposited in the reticuloendothelial system. In large doses it has been known to cause unfavorable changes in experimental animals. However, experience has shown that the amount required for angiography can be used with safety equal to other media. Diodrast in 35 per cent solution unfortunately is irritating and occasionally causes complications. Further, it gives only fair roentgenographic detail. The authors use both Diodrast and Thorotrast as media. Diodrast is probably preferable for introduction by direct puncture. Further, it should be used if repeated angiographic studies are to be done, in order to avoid an accumulative dose of Thorotrast. In the case of iodine sensitivity Thorotrast should be used in preference to Diodrast.

The introduction of dye into the desired vessel may be accomplished either by the open method or by direct puncture. The open method is commonly indicated for study of aneurysms, certain tumors, arteriovenous fistulae. By this method tolerance to ligation of the vessel can be tested. If compression of the contralateral carotid artery allows the contralateral arterocerebral artery to fill, the anterior communicating artery is adequate and carotid ligation will probably be tolerated.

THE NORMAL ANGIOGRAPHIC PATTERN

Three phases of the circulatory apparatus as previously mentioned must be photographed because study with a single exposure is at best a hit-and-miss proposition. With an automatic film changer permitting six exposures during the circulation time, the three angiographic phases can be readily demonstrated. Usually the first two films demonstrate the arterial system. In the third and fourth films the dye is generally ill-defined since it is broken up in

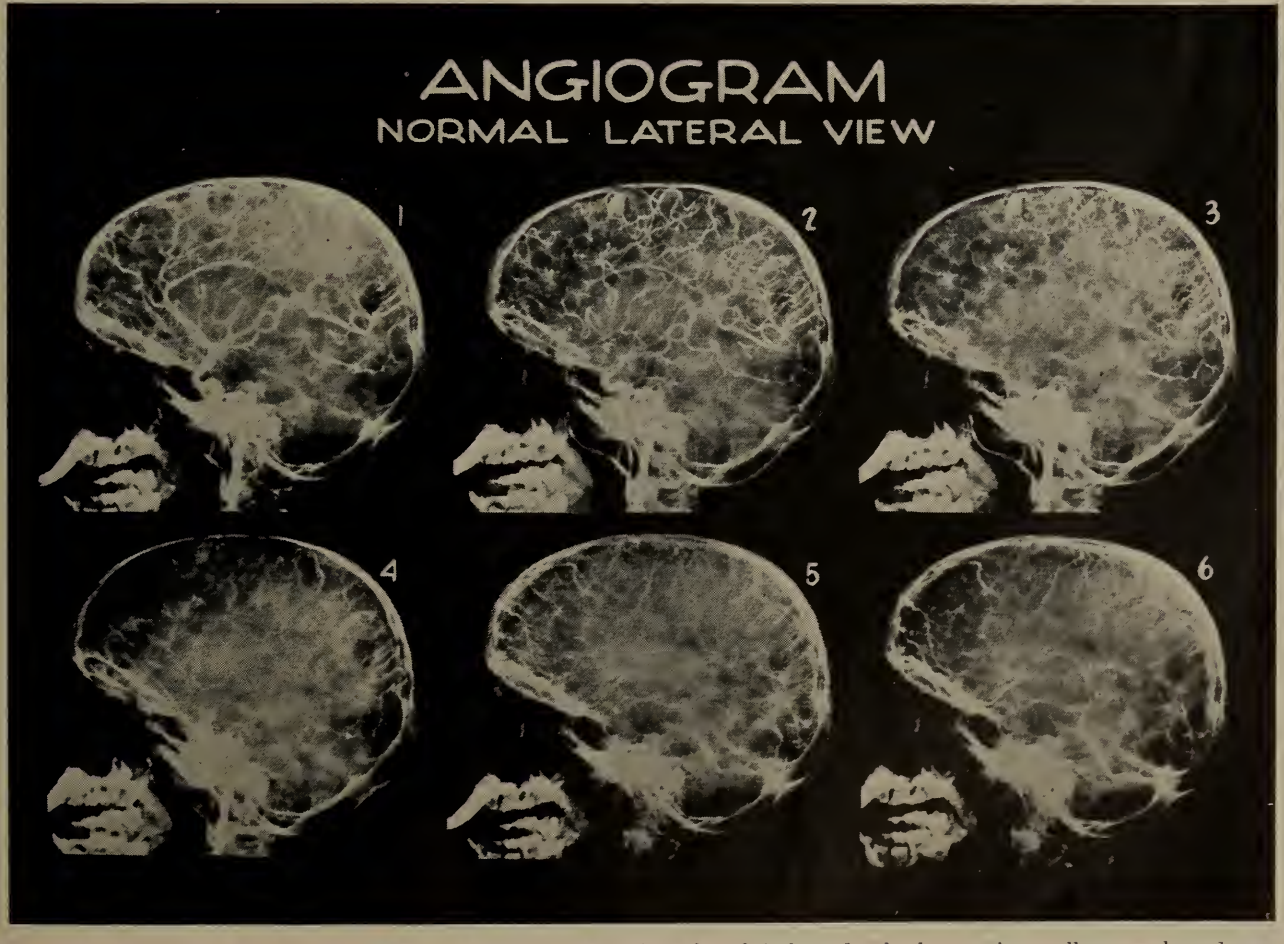

Figure 1.—First films in series show arterial phase. Films 3 and 4 show dye broken up in smaller vessels and capillaries. Film 6 shows large veins and sinuses.

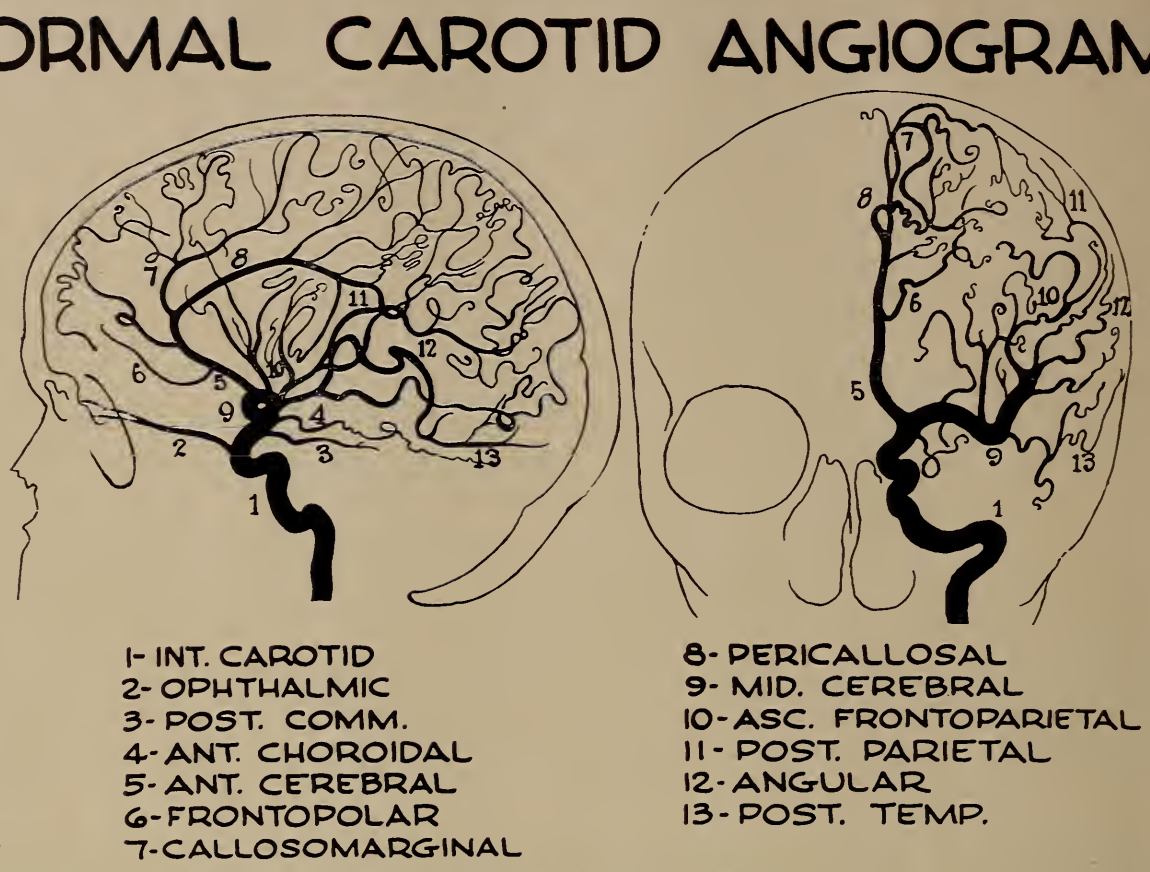

Figure 2.—Drawing made from arteriograms showing principal arteries.

the arterioles, capillaries and venules. In the last two films the dye becomes visible again in the veins and dural sinuses (Figure 1). For practical illustration the blood vessels, which can ordinarily be demonstrated by angiography, have been copied from actual roentgenograms. The cerebral anatomical pattern is shown in Figure 2. The pattern of the veins and sinuses is illustrated in Figure 3. The vertebral pattern is shown in Figure 4.

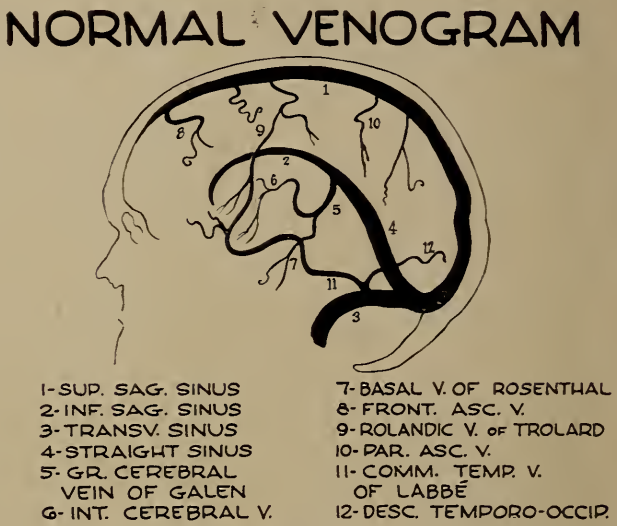

Figure 3.—Drawing showing the principal veins and sinuses.

INDICATIONS

Like other comparable methods of examination, angiography must be employed judiciously. Even though the risk involved is minimal, it can hardly become a routine roentgenographic procedure. On the other hand, most intracranial disorders of an uncertain nature merit its use. Regardless of the type of lesion, if knowledge of the vascular architecture in a particular case is important for surgical repair, angiography is practically mandatory. In the presence of unexplained spontaneous subarachnoid hemorrhage, it is a necessary procedure. It is required for intelligent planning of the surgical management of aneurysms, vascular malformations, arteriovenous fistula, etc. In cases of cerebral lesions with high intracranial pressure, angiography often gives as much information as ventriculography, sometimes more; and it is by far the safer of the two procedures.

The contraindications are sufficiently clear that they require little more than mention. The usual contraindications to minor surgical procedures of an elective nature are generally contraindications to angiography. Further, when the diagnosis is certain, it should not be employed as a routine procedure in conditions for which surgical treatment cannot be of benefit—for example, thrombosis or hemorrhage in arteriosclerotic hypertensive vascular disease. On the other hand, it may be very important in the presence of clinical symptoms simulating those of progressive cerebral thrombosis when

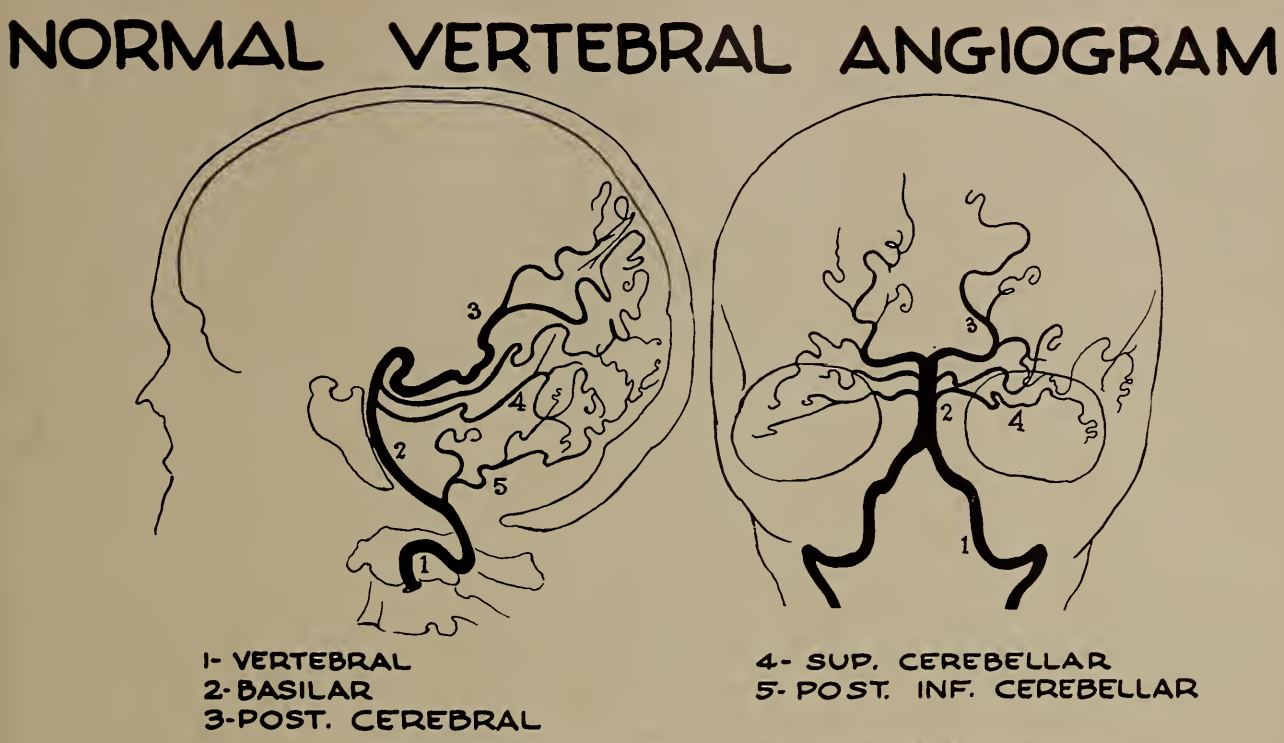

Figure 4.—Characteristic pattern of arteries demonstrable by vertebral arteriography.

Figure 5.—Characteristic distortion of vessels caused by neoplasms or other comparable space-consuming masses within the brain.

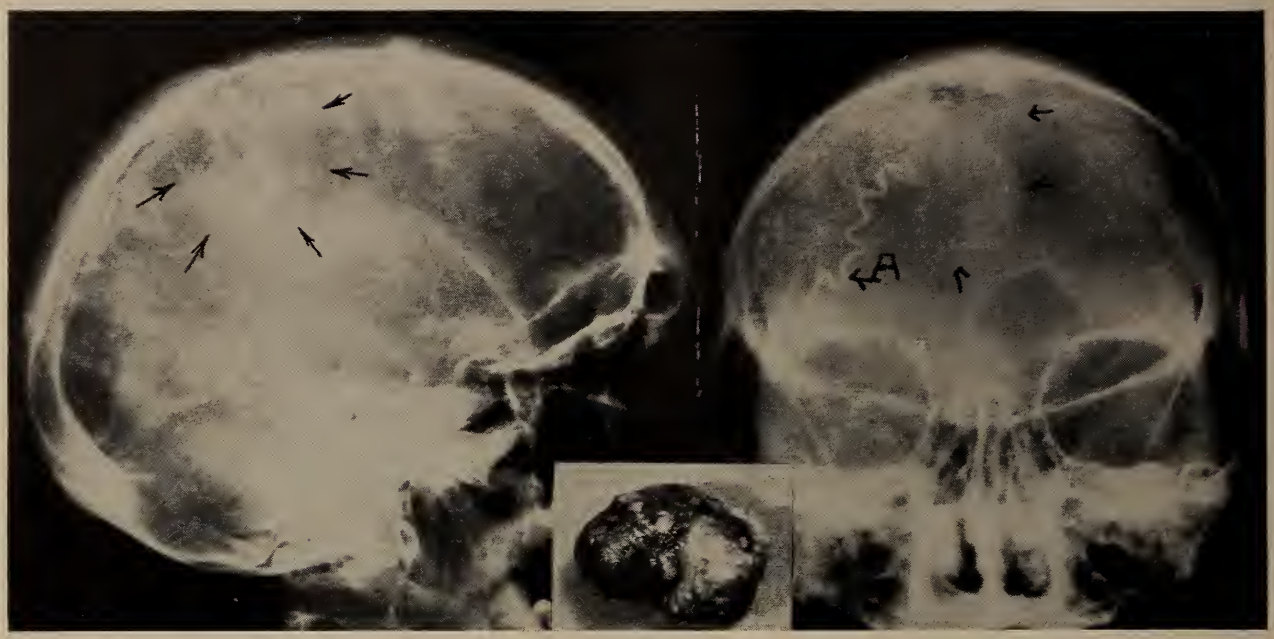

Figure 6.—Angiogram showing capillary phase and concentration of dye in a typical meningioma. (a) Occipital artery feeding tumor. Extirpated tumor shown in insert.

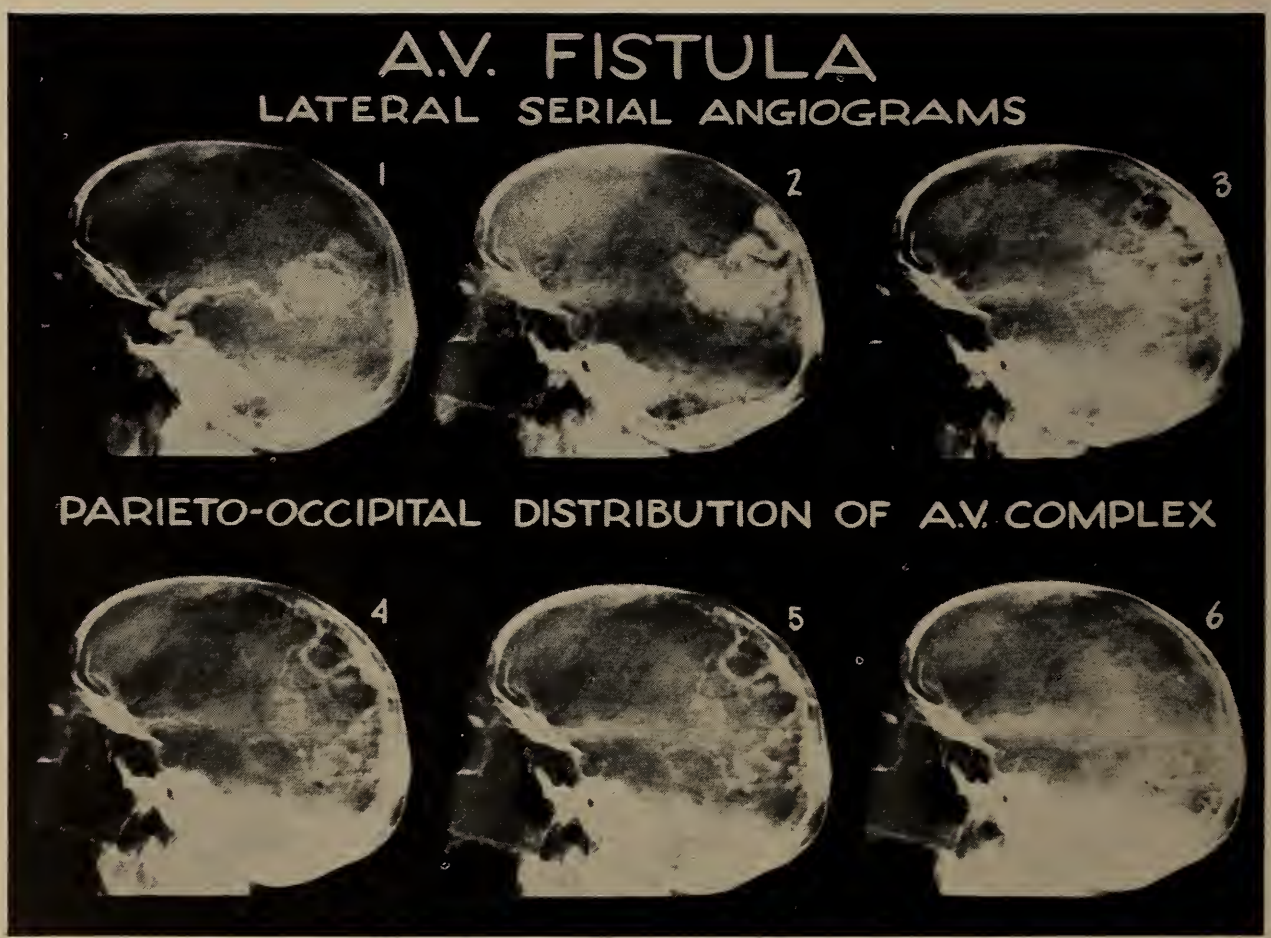

Figure 8.—Angiogram showing the dye concentrated in a typical arteriovenous malformation.

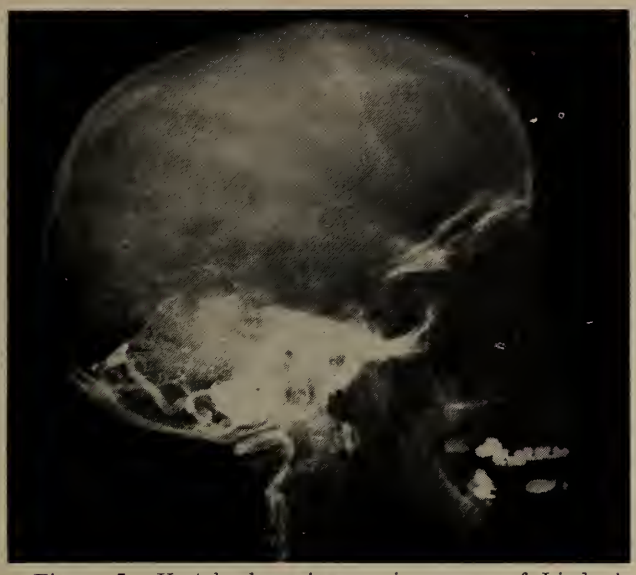

Figure 7.—Vertebral angiogram in a case of Lindau's disease. Dye can be seen concentrated in large hemangiomatous vascular sinuses. The angiogram discloses the location of these vessels, which is a great aid to the surgeon planning operation.

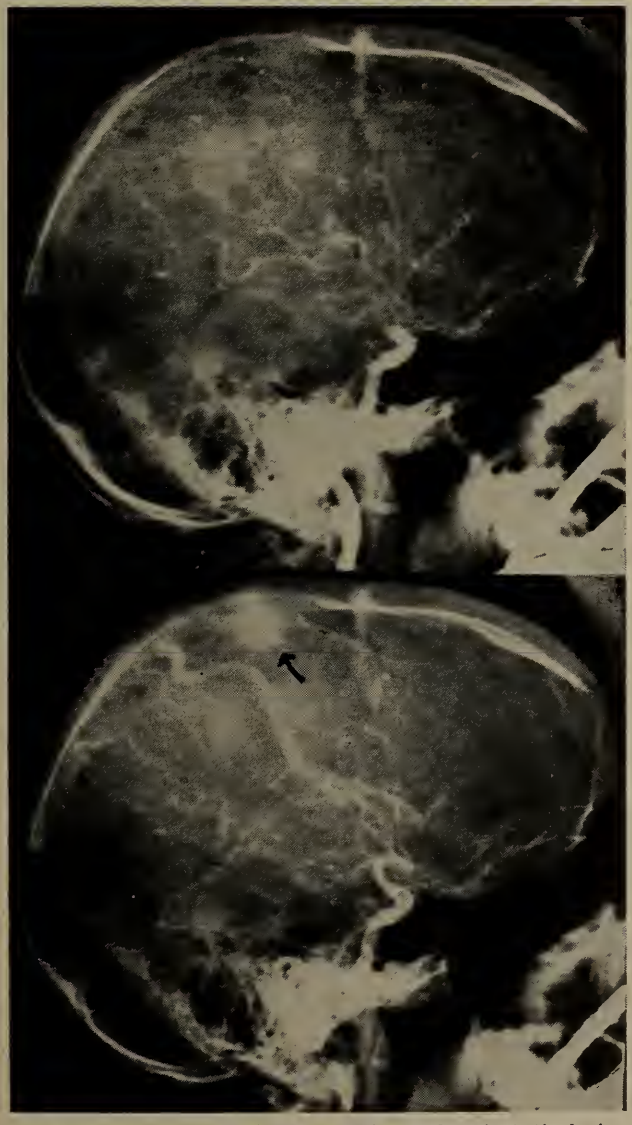

Figure 9.—Arrow points to typical telangiectatic lesion of the cerebral hemisphere that would have been missed entirely without controlled serial cerebral angiography.

hypertension and arteriosclerosis are not too pronounced. Neoplasms often produce such a picture.

PATHOLOGIC CHANGES

Intracranial space-consuming lesions, provided they are sufficiently large, tend to distort the normal arrangement of the vascular pattern. Lesions in the occipital region will usually cause a forward displacement of the vessels. Those in the frontal sector cause posterior or downward displacement, whereas others in the temporal zone cause an upward shift, etc. (Figure 5). These generalities are fairly constant provided the lesion is sufficiently large. However, the degree of displacement and of alteration depends on the size of the lesion and the lines of force it creates.

Neoplasms near the surface, in addition to their displacing qualities, usually have a blood supply of their own which offers a fertile field for angiographic investigation. Deep-seated tumors and especially those within the ventricles are ordinarily best demonstrated by pneumographic visualization. Malignant glioblastic tumors often have areas of necrosis and cyst formation in which an absence of vascularity is observed. In other areas, vascular proliferation is commonly visualized. Overlying convolutions are often widened, displacing the surface veins. Other tumors of the glioma group at times are said to show suggestive characteristic vascular changes. The classification of tumors by angiography, however, should certainly be exercised with caution and subjected to final microscopic verification. Angiography serves chiefly as a localizing agent and may reveal vascular structures which aid considerably in surgical planning.

Meningiomas cause distortion of the vascular system in a manner comparable to the changes caused by other space-consuming lesions. Since their blood supply is often from the external carotid artery, inclusion of this vessel in the angiogram is important. Dye can often be seen entering the tumor through the meningeal arteries. These tumors are ordinarily quite vascular; hence, the capillary phase of the angiogram frequently shows the tumor as a white mass resembling a snowball (Figure 6).

Tumors about the optic nerves or chiasm (for example, pituitary adenoma, craniopharyngioma, meningioma on the tuberculum sella, and optic nerve tumors) seldom present a diagnostic problem and can be recognized by the usual clinical means. Occasionally, however, unusual lesions are encountered and aneurysms must be considered. Therefore, angiography is frequently indicated in cases in which aneurysm in the area is suspected. Tumors of other cranial nerves can likewise be recognized by characteristic history and findings. The acoustic neuroma is probably the most common of these neoplasms and seldom presents diagnostic difficulty.

Rarely do tumors of the posterior fossa offer great difficulty in diagnosis. Angiomatosis retinae at times is associated with hemangioblastic tumors in the cerebellum, and in such instances angi-

Figure 10.—Angiogram showing location of typical pedunculated saccular arterial aneurysm.

ography may aid in the solution of technical problems before operation (Figure 7).

Intracranial arteriovenous malformations are not uncommon. When symptoms are present they are usually mild. Occasionally a bruit is audible over the scalp, but this is the exception rather than the rule. Pneumoencephalography rarely if ever gives conclusive information in such cases. Electroencephalography may establish which side the abnormality is on but never gives reliable information as to the character of the lesion. Angiography, however, establishes the diagnosis and location with certainty (Figure 8). Likewise, telangiectatic lesions can be demonstrated only by angiography. Furthermore, like other lesions they are liable to be missed entirely unless a complete serial angiographic study is done (Figure 9).

Congenital aneurysms are the most common cause of spontaneous subarachnoid hemorrhage. Therefore, unless clinical study shows hypertension,

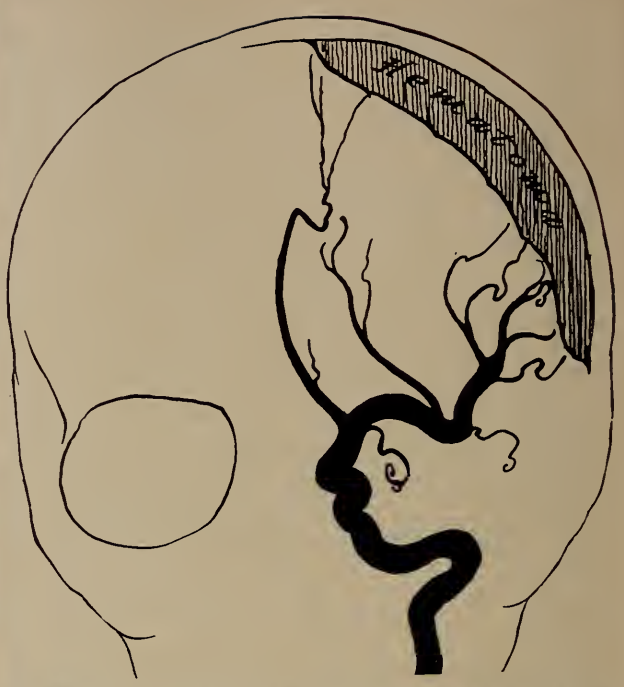

Figure 11.—Artist's drawing from an angiogram showing the vascular shift seen in the case of either subdural or extradural hemorrhage.

hemophilia, polycythemia vera, Dicumarol® intoxication, or other such conditions to be the cause of hemorrhage, angiography should be carried out. Often with with rest and conservative management the leaking will temporarily stop and all symptoms will clear. Some of the lesions are small and undoubtedly heal by thrombosis. Nevertheless, the majority of such aneurysms remain a potential cause of fatal attack unless demonstrated and repaired (Figure 10).

As a rule, angiography is not required for appraisal of lesions resulting from craniocerebral trauma. On the other hand, obscure post-traumatic states, such as chronic subdural hematoma, may be clarified by the procedure. These accumulations of blood cause a characteristic shift of the cortical vascular architectures away from the skull, and as a rule a general shift of the entire vascular pattern away from the lesion (Figure 11). Extradural hemorrhages usually have acute onset a few hours after injury and diagnosis seldom is difficult. Occasionally, however, angiography may be helpful.

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The Adaptation of Electroencephalography to Medicine

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SUMMARY

Electroencephalography is a valuable aid in diagnosis and prognosis of diseases affecting the brain. It has definite limitations.

Abnormal electroencephalograms are either paroxysmal or non-paroxysmal. Both of these changes may be generalized or focal.

Epilepsy is primarily associated with paroxysmal activity. Electroencephalography aids in the diagnosis and in determining the severity, course and response to treatment.

Non-paroxysmal activity, although less specific in pattern, indicates either generalized or focal pathologic change or some alteration of the normal structure of the brain. Non-paroxysmal activity may give supportive evidence referable to conditions, systemic or intracranial, which disturb the state of consciousness.

ELECTROENCEPHALOGRAPHY, which is a study of the electrical potentials of the cerebral cortex, has attained a degree of accuracy in dealing with diseases of the brain which is comparable to that of other laboratory procedures. It cannot, however, be considered a substitute for sharp clinical observation and sound clinical judgment.

Although the fundamental patterns of electrical energy emanating from the surface of the brain are relatively simple, the components entering into the formation of these pattern structures may be quite complex, and for this reason useful interpretation is dependent upon the skill of the electroencephalographer, who should have clinical experience as well as a grounding in physiology.

Briefly, the recording of electroencephalograms is carried out by means of electrodes which are attached in some convenient way to the scalp. The electrodes are placed in varying numbers over the five major areas of the brain, namely, frontal, motor, parietal, occipital and temporal areas. The waves picked up are amplified and are recorded in most instances on moving paper tape by means of magnetic ink-writing pens.

The recorded potentials from the cerebral cortex vary from 2 to 200 microvolts in amplitude and mostly occur within a frequency range of 1 to 30 cycles per second. The normal electroencephalogram has a dominant frequency which varies from 8 to 12 cycles per second and averages about 10 cycles. This frequency is called the "alpha" rhythm. A secondary group of waves ranging from 18 to 30 cycles per second is called the "beta" rhythm. (Figure 1.)

If this wave formation is considered with respect to the billions of neurons within the cerebral cortex, it becomes immediately obvious that potentials arising from each cell unite in some way so that they discharge in unison and appear on the tracing as a simple rhythm.

It is well then to consider both the spontaneous activity of cortical neurons and the associated synchronizing process. The electrical output of the neurons is related to the intrinsic metabolic process of the cerebrum. With an increase of metabolic activity the frequency of the brain waves is increased: conversely, a decrease in metabolic activity reduces the frequency of the brain waves.

Alterations in the environment of the cell which affect the state of its membranes, such as disturbances in ionic concentration, variations in interstitial fluid and the fluctuations of influent electrical impulses from remote regions, alter the individual neuronal pulsation. This alteration of the neuronal beat will appear in the electroencephalogram as a change in the rate of discharge, a distortion of the wave form and a variation in the amplitude of the wave.

It is postulated that the neurons of the cortex are held in synchronous beat one with another by so-called "pacemakers" which are located in areas, as yet undiscovered, deep within the substance of the brain.

If synchronization is increased the overall potential is increased and the frequency is more constant, but with reduced synchronization the cortical potentials disintegrate into a series of irregular, rapid and feeble oscillations. The waxing and waning (modulation) of the alpha rhythm in a well relaxed person exemplifies the regulatory control of the pacemakers. The destruction of cortical rhythm by opening of the eyes results from disturbance of the pacemakers.

Other factors remaining equal, the electroencephalograms from any one individual remain essentially the same from day to day. Differences between individuals may be quite extensive and yet remain within the known limits of normal. In one, the electroencephalogram is high in amplitude and regular in rhythm, in another, the rhythm is disorganized almost completely.

Deviations from the normal are manifested by

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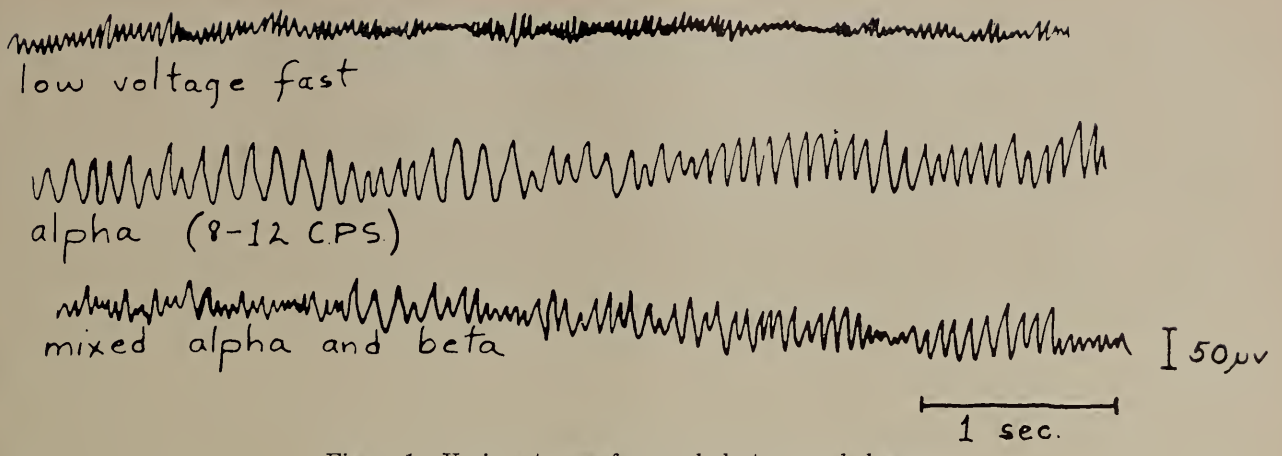

Figure 1.—Various types of normal electroencephalograms.

changes in amplitude and frequency. Factors directly or indirectly stimulating the cerebral cortex speed up the frequency of the electroencephalogram. Factors which act as cortical suppressors slow down the frequency of the electroencephalogram.

An abnormal electroencephalogram, then, may be one which is too fast, one which is too slow, or one which is both too fast and too slow. It may be continuous or paroxysmal, generalized or focal, mild or severe. It may be associated with a generalized or localized change in amplitude—either increased or decreased. Also, variations in wave form and pattern may accompany the shift in frequency.

Some of the factors influencing the normal electroencephalogram are:

Age. From infancy to the age of 13 or 14 years the frequency progressively increases until the average of 8 to 12 cycles per second has been reached. The rhythm slowly stabilizes and remains quite constant until the person is 35 or 40 years of age, at which time regularity and rhythmicity give way to irregular, low voltage, fast-and-slow waves.

Attention alters the rhythmicity of brain waves by influencing the synchronizing mechanism. With alertness the alpha rhythm may speed up slightly and the amplitude of the waves decrease. Superimposed low voltage fast waves may appear in the frontal regions. With reduction in attention by dozing or by decrease of alertness the basic frequency is retarded, and with the progression into light sleep slow waves appear which are interrupted by bursts of fast waves resulting from a reorganization of the pacemakers. As the depth of sleep increases, fast waves seem to disappear and there remain only random slow waves. With return to the waking state, the process is reversed.

Oxygen and Sugar. The brain maintains an equilibrium in its consumption of oxygen and sugar. A reduction of either of these substances in quantity or an inability of the cells to utilize the substances acts to suppress cellular function. The resulting electroencephalogram appears much as it does in sleep. As awareness is disturbed, the spontaneous waves become disorganized; with mild loss of consciousness, high amplitude slow waves mixed with low amplitude fast waves appear. As unconsciousness deepens, the frequency slows considerably and all fast activity disappears. There is a direct relationship between the wave frequency of the electroencephalogram and the level of consciousness.

Drugs that act as stimulators, such as caffeine, Benzedrine,® and strychnine, increase the frequency of the electroencephalogram. Drugs acting as depressants—that is to say, the barbiturates as a whole, paraldehyde, ether, alcohol, bromides, etc.—cause the electroencephalogram to slow in proportion to the depth of narcosis. (The initial stimulating effect of sodium amytal and sodium pentothal, however, results in an increase in frequency.)

Carbon dioxide. The effects of reduction of carbon dioxide are critical. Overbreathing, which is commonly encountered, introduces slow waves into the electroencephalogram in the majority of cases. Generally, the response to overbreathing is greatest in children, least in persons above forty years of age. In the presence of low oxygen tension and low blood sugar, the response to hyperventilation is exaggerated. Diagnostically, the response to hyperventilation is not considered significant in adults unless it is severe and in children unless it precipitates a slow wave-and-spike complex.

Abnormal electroencephalograms divide themselves into two distinct categories, those showing paroxysmal activity and those showing non-paroxysmal activity. For best clinical purposes the paroxysmal activity is associated with the epilepsies and allied disorders and the non-paroxysmal activity is associated with other pathologic conditions of the brain.

It is well to reemphasize that as it is the electrical activity of the cerebral cortex which is recorded on the electroencephalogram, abnormalities of the brain remote from the cortex are demonstrated in the electroencephalogram only if the cortex is affected by some commuted influence—whether this be through the interstitial fluids or via intercellular pathways.

Paroxysmal activity may be one that is too fast, the type found in grand mal epilepsy; one that is too slow, the type associated frequently with psycho-

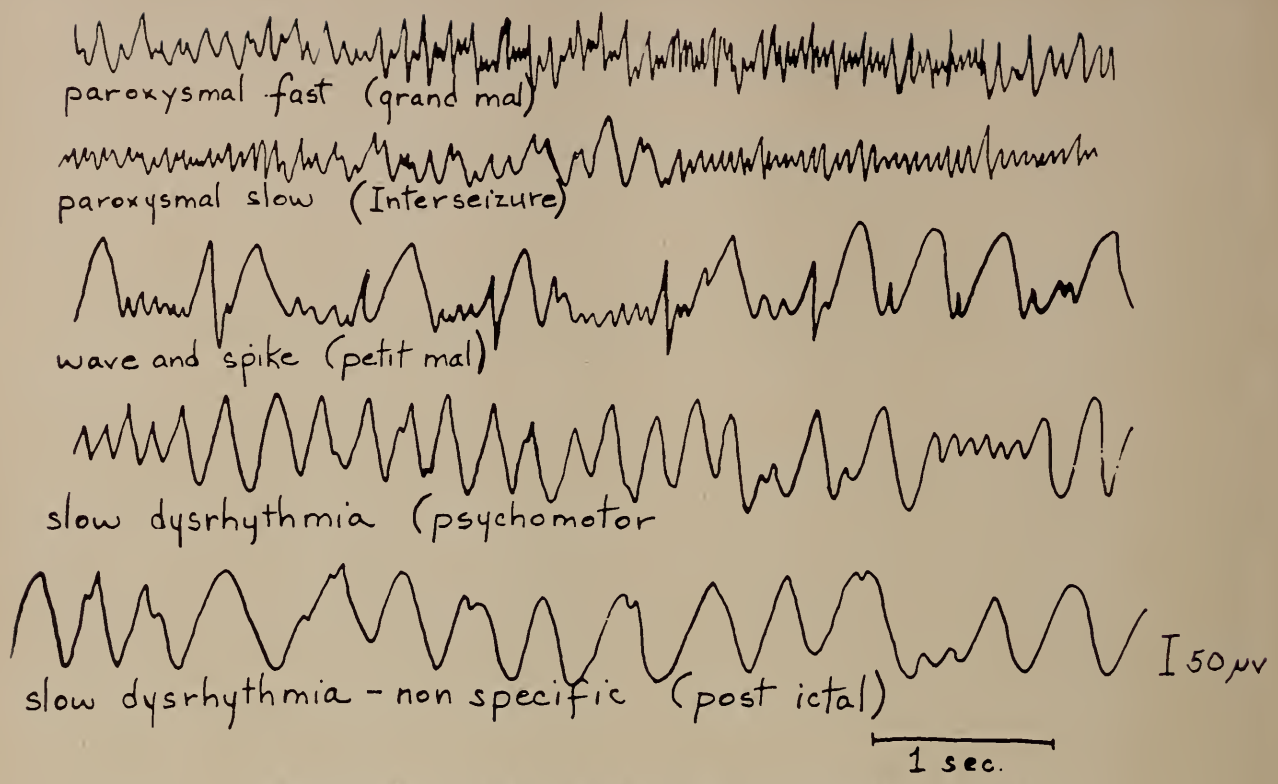

Figure 2.—Different types of waves during seizure and interseizure periods.

motor epilepsy; one that alternates between too fast and too slow (hump-and-spike wave), the type pathognomonic of petit mal epilepsy; or any combination of these three (Figure 2).

The origin of these wave patterns is obscure. They may appear over the entire cortex or symmetrically from two homologous areas which are discharging synchronously at a rate different from the remainder of the brain. They may "fire off" at a focus and remain focal or may spread over the cortex. There may be two or more foci discharging simultaneously, a situation which may lead to difficulties in interpretation.

Records of the seizure types are fairly consistent during the attack. Interseizure records range from completely normal to almost continuous dysrhythmia with patterns less obvious. Since the majority of electroencephalograms are taken during the absence of seizures, diagnosis is usually based upon the paroxysmal nature of the dysrhythmia rather than the pattern type. This, however, is not wholly true and much information can be gained by attempting to classify the interseizure dysrhythmia.

As to the reliability of electroencephalography in epilepsy, single recordings will show paroxysmal activity in about 40 per cent of cases and less well defined abnormality in about 20 per cent of cases, rendering the diagnosis fairly accurate in about 60 per cent of cases. As a working criterion, wave-and-spike activity is diagnostic; non-specific, paroxysmal activity is confirmatory; abnormal fast or slow, more or less non-paroxysmal activity is suggestive of epilepsy. Serial recording over a period of time increases the percentage of accuracy.

Predisposition to a convulsive disorder is suggested by the fact that near relatives of epileptic children have electroencephalographic abnormalities nine times more frequently than near relatives of normal children. Twenty-eight per cent of children with epileptic parents or near relatives have cerebral dysrhythmia without having demonstrable seizures. In convulsion-susceptible identical twins, both are expected to have comparable dysrhythmia, although only one may have seizures. In similar twins who are not convulsion-susceptible, symptomatic epilepsy may result from cerebral trauma. The injured twin may have dysrhythmia while the uninjured may not.

Electroencephalography has become useful in following the course of epileptic patients under treatment. The paroxysmal activity increases with the approach of a seizure and is relatively silent during the interseizure period. Anticonvulsant drugs do not inhibit dysrhythmia but do reduce it to a degree. Periodic checking will often reveal the anticonvulsive effect of the therapeutic agent on the patient.

Dysrhythmia associated with latent convulsive disorders may be brought out by recording electroencephalograms during sleep. In psychomotor epilepsy, spikes which are suppressed during the waking state appear in the anterior portions of the temporal lobes during sleep.

Non-paroxysmal abnormality is less specific than paroxysmal. The abnormality may be generalized (Figure 3) indicating an involvement of the cortex as a whole, or it may be focal (Figure 4). It may be fast or slow. Fast activity implies stimulation of the cortex and slow activity suppression. The cortex

is more responsive to acute disturbances. As the condition becomes chronic, the cortex tends to adjust itself and reestablish its rhythm, so that the electroencephalogram may be normal even though clinical symptoms persist and there is evidence of permanent damage. Corollary to this is the relationship of the electroencephalographic change with the level of consciousness. In the presence of delirium (which may be induced by a number of conditions such as generalized systemic disturbance of metabolism, anoxia, hypoglycemia, fever, nutritional deficiency, and drug intoxication) or in the presence of generalized intracranial involvement by infectious, vascular disorders, brain softening and degeneration, brain edema or internal hydrocephalus, the electroencephalogram shows high voltage random slow activity mixed with fast waves of moderate amplitude. The dominance of slow activity over fast is related to the acuteness of the delirium, the depth of stupor and the severity of cellular involvement. As the delirium subsides, the slow random activity becomes less pronounced and fast waves more prominent until, with the disappearance of delirium, the electroencephalogram approaches normal. As the disease process becomes chronic, the cerebral cortex tends to reestablish its rhythm and the electroencephalogram then will not reveal the residual pathologic condition.

Some of the diseases showing acute generalized electrical involvement of the cerebral cortex are: systemically, general infections, cardiovascular-renal diseases with cerebral involvement, and metabolic disorders; intracranially, encephalitis (all forms), syphilis of the central nervous system, cerebral trauma, meningitis, hemorrhage, thrombosis and demyelinizing diseases. The electroencephalogram is abnormal in Sydenham's chorea only if the cortex is involved. Diseases of the basal ganglia, such as Parkinsonism, do not alter the electroencephalogram. Subdural hematoma, unless the brain is displaced, may produce a mild depression of amplitude without otherwise altering the electroencephalogram.

During the course of these diseases a latent convulsive disorder may be released or activated and a paroxysmal dysrhythmia appears in addition to the generalized non-paroxysmal activity.

If the cortex is directly involved, local pathologic changes in the brain are revealed as an electrical focus. Some of the conditions most readily diagnosed and localized are tumors such as meningiomas, metastatic lesions, acute vascular accidents, local trauma, and abscesses. Of these lesions, abscesses lend themselves to diagnosis more readily than the others.

Deep lesions, such as infiltrating gliomas, thromboses, hemorrhages and local areas of demyelinization in the white matter of the brain, can be localized only if there is interruption of the subcortical pathways involved in maintaining normal cortical rhythm. Deep midline lesions involving the corpus callosum often bring about a bilateral symmetrical

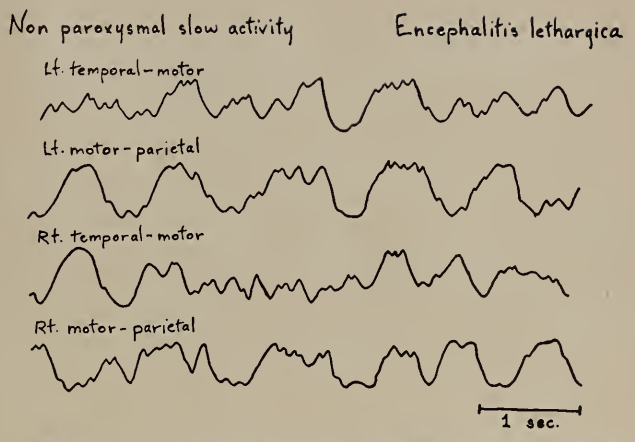

Figure 3.—Random, slow activity seen in acute conditions of the brain frequently associated with disturbance of consciousness.

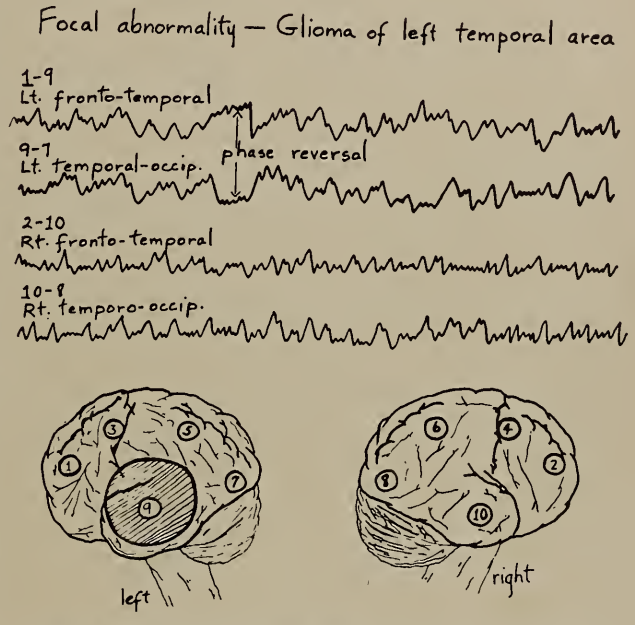

Figure 4.—Focal slow activity in this case results from interruption of subcortical fibers to the left of the temporal area.

abnormality of the electroencephalogram which resembles that of the diffuse involvement of the cortex in delirium.

Lesions below the tentorium, for practical purposes are not amenable to localization by the electroencephalogram.

Because of the sensitivity of the electroencephalogram to the degree and intensity of cortical dysfunction, serial recordings may be most helpful in following the course of intracranial disease. It becomes useful in differential diagnosis. On the one hand, early, minor disintegration of the normal alpha rhythm from one hemisphere which progressively becomes slower and which ultimately (in a few months) develops into a slow wave focus in one of the major areas of the hemisphere suggests strongly the presence of an expanding space-occupying lesion. On the other hand, a rather acute and active focus which shows a shifting toward normal

describes a lesion, such as a thrombosis, which is resolving. Local abnormalities in the case of multiple sclerosis appear and disappear with exacerbations and remissions of the disease. The slowing of the waves is coordinated with edema.

In some instances, electroencephalography has a degree of legal status. Some of the indications are controversial but in general the presence of paroxysmal activity supports the clinical impression of epilepsy. Residual abnormalities after a three-month post-concussion period are strong evidence of permanent brain damage. Negative findings are less convincing because it is recognized that the brain adjusts to chronic disorders and will reestablish its basic rhythms, thereby presenting a normal electroencephalogram in the presence of unchanging brain damage. The presence of local pathologic changes can at times be revealed through the use of accessory techniques, such as induced sleep and cerebral stimulation by Metrazol,® which may activate damaged tissue that under normal conditions is electrically inactive.

Functional disorders such as psychoneurosis, psychosis, personality disturbances, etc., at present do not show abnormalities in the electroencephalogram sufficient to be diagnostic. Further investigation promises some clarification in these conditions which may help the clinician.

Diagnostic Contributions of the Electromyogram

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SUMMARY

When muscles contract, they generate electricity. This muscle electricity can be seen and heard on the electromyograph. Normal muscles generate a different type of electrical impulse than do paralyzed muscles, and for this reason the electromyograph is of great assistance in the diagnosis, prognosis and treatment of such conditions as poliomyelitis, nerve injuries and strokes.

ELECTROMYOGRAPHY is the science which treats of the recording and measurement of the voltages generated by normal and abnormal muscles. In order to record and measure muscle voltages accurately, it is first necessary to elicit them from a muscle by means of a needle electrode in the muscle. Next these minute voltages must be amplified many times and then converted into visible patterns and sound energy by means of a cathode ray oscillograph and loud speaker. The instrument which elicits, amplifies, and converts the muscle voltages into visible patterns and sound energy is called an electromyograph (Figure 1) and the permanent record of the muscle voltages, which is obtained by photographing the visible patterns on the cathode ray oscillograph, is called an electromyogram. When interpreted correctly, electromyograms are a useful adjunct to the neurological examination in assessing the functional integrity of the neuromuscular system.

Relaxed normal voluntary muscle generates no voltages which can be recorded by the electromyograph. In other words, a completely relaxed normal voluntary muscle is an "electrically silent" one from the electromyographic standpoint. Normal voluntary muscle which is made to contract as a result of either voluntary or reflex effort generates what are termed "normal motor unit voltages."

A motor unit has been defined by Denny-Brown and Pennybacker[3] as a functional unit consisting of one anterior horn cell together with its axon and the 100 to 150 muscle fibers which the axon innervates. When the axon of such a motor unit is excited, all of the muscle fibers appear to contract synchronously, and as a result of the spread of the contraction wave, a simple (monophasic, diphasic, or triphasic) voltage is generated.

Normal motor unit voltages range in magnitude from about 100 to 2,000 microvolts and are readily elicited from all areas of the contracting normal muscle. The duration of a single wave is of the order of 3 to 10 milliseconds, and the repetition frequency varies from about 5 to 30 per second, depending on the force of contraction. Because of their simple wave form and relatively long duration, normal motor unit voltages produce a very characteristic thumping noise in the loud speaker.

When voluntary muscle has been deprived of its nerve supply or denervated for various periods of time, depending upon the species, the individual denervated muscle fibers begin to twitch in a rhythmic manner. This rhythmic twitching of denervated muscle has been termed denervation fibrillation and, according to Denny-Brown and Pennybacker,[3] results when the denervated muscle fibers become sensitized by neural atrophy to small amounts of acetylcholine in the normal circulation. Since the term denervation fibrillation denotes the involuntary contractions of individual muscle fibers, it is of great importance to note that true denervation fibrillation cannot be observed clinically through the intact skin. In order, therefore, to detect and prove its presence in a muscle, it is necessary to employ electromyography. The voltages generated by fibrillating denervated muscles are termed denervation fibrillation voltages and range in magnitude from about 5 to 100 microvolts. They usually have a diphasic wave form, and their repetition frequency varies from about 2 to 30 per second. A single wave has a duration of only 1 to 2 milliseconds, and because of its extremely short duration, a fibrillation voltage produces a very characteristic clicking noise in the loud speaker.

When a denervated muscle becomes reinnervated —that is, when it again acquires nerve substance through regeneration of its own nerve—it generates motor unit voltages which are highly polyphasic or complex in wave form. Because Weddell and associates[7] observed these highly complex motor unit voltages in muscles during the early stage of reinnervation after peripheral nerve lesions, they designated them as "nascent" motor unit action potentials or voltages. In a later communication, these investigators[8] stated that they believed the term "nascent" to be an inaccurate one because they thought it theoretically possible to have highly polyphasic or complex motor unit voltages during the course of demyelinating diseases. Other investigators[4] recently reported that complex motor unit voltages are a constant finding in muscles following poliomyelitis and in such degenerative diseases as amyotrophic lateral sclerosis and progressive muscular atrophy. From these observations, they have concluded that highly polyphasic or complex motor unit voltages are abnormal electromyographic

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phenomena and as such may represent either early nerve degeneration or early nerve regeneration.

It was pointed out previously that the muscle fibers of a normal motor unit contract synchronously, thus producing a simple motor unit voltage. The muscle fibers of an abnormal motor unit, on the other hand, appear to contract asynchronously, thus producing a complex or highly polyphasic motor unit voltage.

Complex or abnormal motor unit voltages range in magnitude from about 1,000 to 1,500 microvolts. Their repetition frequency varies from about 2 to 30 per second, and the duration of a single wave group is usually in the range of 5 to 15 milliseconds. Because of the complexity of these waves, abnormal motor unit voltages give rise to a very rough sounding noise in the loud speaker.

Most clinicians usually associate fibrillary twitchings of muscles with such degenerative diseases as amyotrophic lateral sclerosis and progressive muscular atrophy. The electromyographist, however, prefers to designate such visible involuntary contractions as fasciculations and to reserve the term denervation fibrillation for the invisible involuntary contractions of individual denervated muscle fibers. From the electromyographic standpoint, a complex fasciculation voltage simply represents the involuntary contraction of an abnormal motor unit. The characteristic voltages generated by normal, denervated and partially denervated muscles are illustrated in Figure 2.

It should be emphasized that denervation fibrillation is a phenomenon characteristic of denervated muscle, and for this reason denervation fibrillation voltages are not elicited from a muscle unless Wallerian degeneration of the nerve supply has taken place. Because of this fact, denervation fibrillation is a valuable objective sign of lower motor neuron disease. This is true because it is a constant finding following known lesions of the final common path and one that can neither be controlled by the patient nor observed clinically through the intact skin by the physician. When recorded electromyographically, however, its presence aids greatly in differentiating between upper and lower motor neuron disease,[1] myopathy and atrophy,[8] and functional and organic paralyses.[4] (Any precise objective test finds wide application in medicolegal fields, and electromyograms obtained by photographing a cathode ray oscillograph have been accepted as evidence in both federal and superior courts in California.)

The presence of denervation fibrillation can be of use in localization.[2,6] If for example, an upper extremity is examined and denervation fibrillation is noted only in those muscles receiving innervation from the median nerve, the electromyographic findings are consistent with a lower motor neuron lesion of the median nerve. In addition, it may be concluded that a certain percentage of the axons have undergone Wallerian degeneration. If on the other hand, the distribution of the denervation fibrillation corresponds to the distribution of the 7th cervical root, the electromyographic findings are consistent with a lower motor neuron lesion involving the 7th cervical root. Depending on the percentage of muscle fiber fibrillation, it can be further concluded that the electromyographic findings are consistent with the patient's complaints of paralysis, paresis, or fatigability. In order to express an opinion, however, concerning the cause of the peripheral nerve or root lesion, the electromyographic findings must

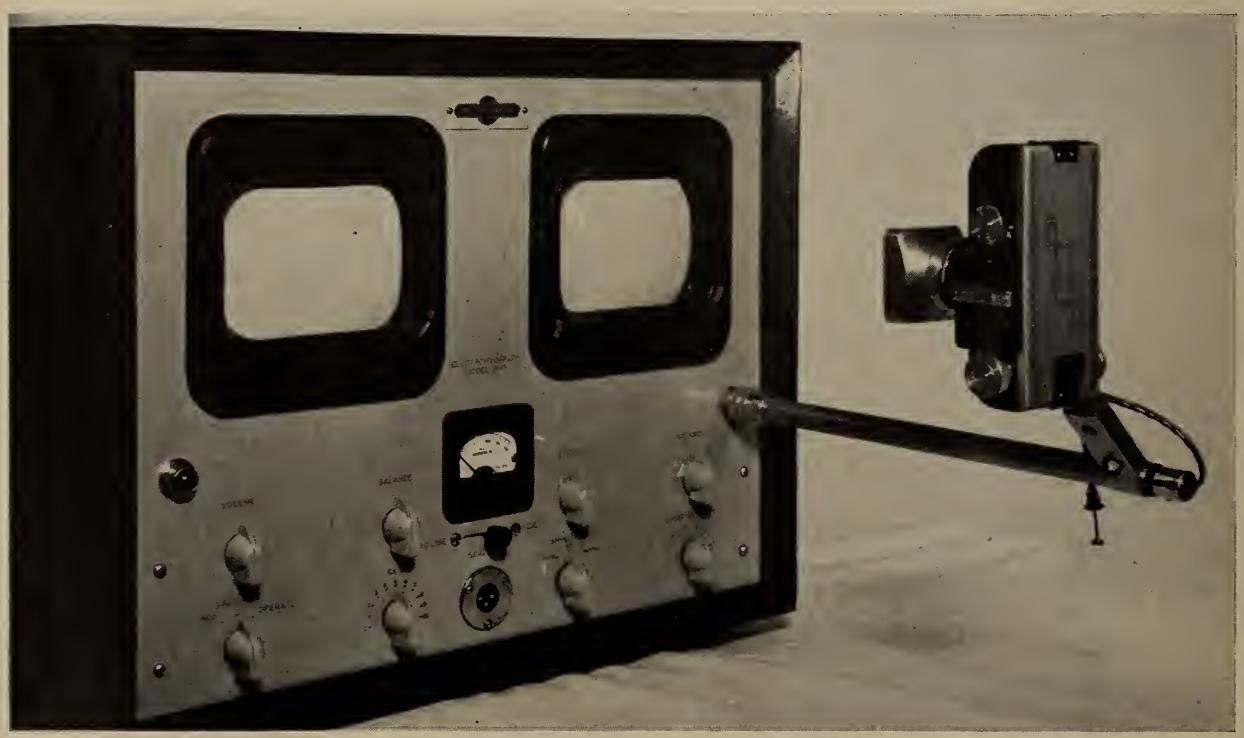

Figure 1.—Electromyograph, consisting of amplifiers, cathode ray oscillograph, loud speaker and camera.

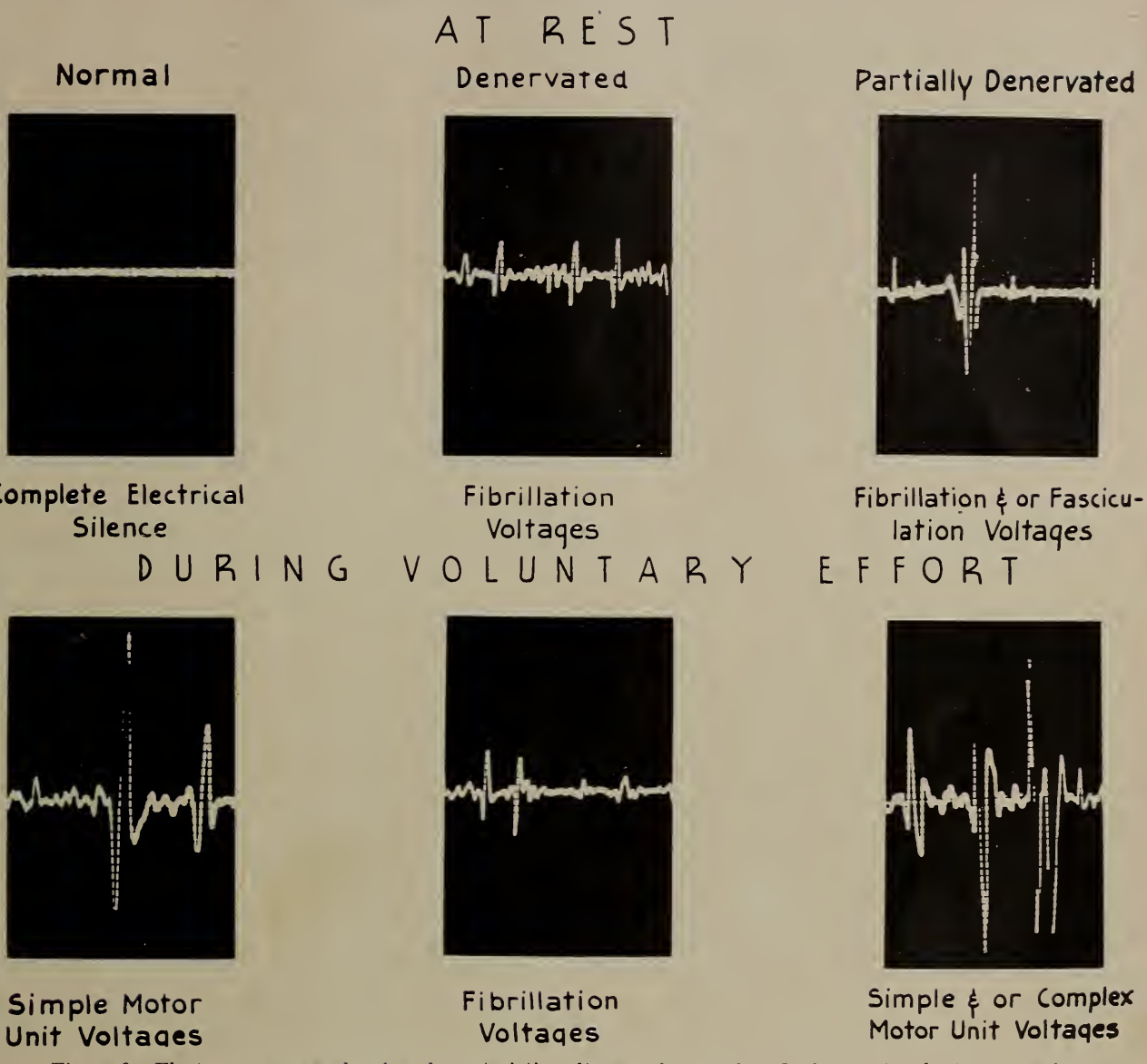

Figure 2.—Electromyograms, showing characteristic voltages of normal and abnormal voluntary muscle.

be correlated with a careful history and clinical examination.

While it is true that the presence of denervation fibrillation in a muscle indicates that some of the muscle fibers are completely denervated, it likewise indicates that these muscle fibers are still contractible tissue and capable of reinnervation once a nerve regenerates to them. This fact is very helpful in forming a prognosis relative to either ultimate functional recovery or ultimate permanent disability. When, however, an appreciable amount of denervation fibrillation in a muscle is noted, these muscles should receive vigorous physical treatment in the form of interrupted galvanic stimulation combined with heat and massage to prevent irreversible fibrotic changes and consequently a poor functional result.[5] A case in point is the patient with fracture and concomitant peripheral nerve lesions, who because of extensive wasting and fibrosis of the muscles is unable to use the injured limb even though the bones heal well.

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CASE REPORTS

- Primary Spindle-Cell Sarcoma in the Right Auricle
- Hematuria Following Ingestion of Pyribenzamine Hydrochloride
- Familial Occurrence of Polycythemia and Leukemia

Primary Spindle-Cell Sarcoma in the Right Auricle

EDMUND L. DUBOIS, M.D., ONER B. BARKER, M.D., and PETER SOYSTER, M.D., *Los Angeles*

PRIMARY malignant tumors of the heart are rare, approximately 100 having been reported in the world literature to date.[12] Perlstein,[6] in an excellent review in 1918, collected reports of 31 cases and demonstrated the characteristics of the clinical and pathological syndrome produced by these tumors, namely, the multiplicity of symptoms and findings which do not fit the pattern of any common form of heart disease, and the frequent origin of these neoplasms in the right auricle. Bodenheimer,[2] who reported the first primary malignant cardiac tumor in 1865, well stated the clinical problem: "One can think of heart tumor when history, clinical examination, and observation do not speak for any other heart disease, when the symptoms occur rather suddenly and unexpectedly and the condition soon takes a faster, soon a slower course." Five cases of malignant cardiac tumors have been correctly diagnosed during life.[1, 7, 8, 9, 11] A few probable rhabdomyosarcomas have been reported.[1, 3, 4] Mahain[5] recently extensively surveyed the literature on all types of primary cardiac tumors and his studies of the sarcomas led him to conclusions similar to those previously mentioned.

CASE REPORT

The patient, a Mexican male 25 years of age, had been well until seven days previously. Then, while running to catch a streetcar, he noted for the first time an empty sensation in the epigastrium and slight shortness of breath. These symptoms persisted even without exercise, and three days later there developed substernal "heaviness" which seemed to ascend into the neck and which was associated with what the patient described as a "ball in the throat." The dyspnea and substernal oppression became progressively more severe. During the first five days following the onset of symptoms, the patient continued to work as a cement worker, but two days before admission to the hospital the symptoms became so severe that he was required to cease work. No other symptoms were elicited, and no further details referable to the present illness could be obtained from the patient.

Physical Examination: The temperature was 98.4° F., the pulse rate 130 and respirations 36 per minute. The blood pressure was 104 mm. of mercury systolic and 86 mm. diastolic in both arms. The patient was well developed, well nourished, alert, cooperative, mildly orthopneic, and apparently dyspneic.

Definite venous distention was noted in the neck. There was no tracheal shift and no enlargement of the thyroid gland.

The chest was symmetrical, with bilaterally equal respiratory movements, and there was no apparent deformity. On percussion, bilateral dullness was noted below the eighth thoracic spine posteriorly, and there appeared to be no descent of the diaphragm on deep inspiration. There was a suggestion of a change in dullness, with a shift to either lateral decubitus position. Breath sounds were diminished over this same area of dullness, with somewhat more diminution on the right side than on the left. Voice sounds were diminished over the same area. Moist inspiratory rales were noted over both bases; they were louder on the left.

The apex of the heart was approximately 2 to 3 cm. to the left of the midclavicular line in the sixth intercostal space, and dullness to percussion indicated that the right border was approximately 1 cm. lateral to the right sternal border in the fourth intercostal space. The heart sounds were very distant, and no murmurs, thrills, or rubs were noted. The rhythm was regular, and the pulmonic second sound was greater than the aortic second sound.

The liver was palpable 3 cm. below the right costal margin. The edge was smooth and the entire liver was slightly tender to deep palpation. No other organs were palpable, and no further abnormalities were noted.

Hemoglobin content of the blood was 14 gm. per 100 cc. Erythrocytes numbered 4.51 million and leukocytes 10,250 per cubic mm. Results of Wassermann and Kahn tests were positive. The packed cell volume was 40 mm. Corrected sedimentation rate (Wintrobe) was 0.0 mm. in one hour. Results of urinalysis were within normal limits.

Bilateral pleural effusions, with evidence of associated mediastinal or small pericardial effusion, were noted on an x-ray film of the chest (Figure 1).

Sinus tachycardia (120 per minute), with electrical alternans, was recorded upon an electrocardiogram. The tracing was consistent with that commonly observed in acute pericarditis.

Venous pressure was 380 mm. of water, and manual pressure over the liver caused the fluid in the manometer to go over the top (over 400 mm.).

Circulation time, arm to lung, was 10.5 seconds using 1 cc. of ether intravenously, and arm to tongue was 30 seconds using 6 cc. of sodium dehydrocholate (Decholin®).

The cardiac silhouette on a teleroentgenogram was of "water bottle" type and there was pronounced, generalized enlargement on fluoroscopy. Cardiac pulsations and vascular indentations were almost completely absent. In addition, the basal silhouette of the heart appeared broadened. The findings were consistent with clinical diagnosis of pericarditis with effusion.

Clinical Impression: (1) Possible rheumatic fever or other hyperergic disease with pleural, pericardial, and possibly peritoneal involvement. (2) Possible acute myocardial infarction.

The initial treatment consisted principally of oxygen in-

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halation, sedation, and salt restriction. On the second hospital day the patient rapidly became extremely dyspneic. The blood pressure was 120 mm. of mercury systolic and 85 mm. diastolic. A right thoracentesis was performed, and following the removal of 350 cc. of clear straw-colored fluid the patient fainted. Prompt recovery occurred after inhalation of ammonia fumes. Specific gravity of the pleural fluid was 1.013, and the total protein content was 2.3 gm. per 100 cc. Smears and cultures were negative for all organisms including Mycobacterium tuberculosis. An electrocardiogram showed sinus tachycardia (108 per minute) and the other changes which were consistent with acute pericarditis with effusion.

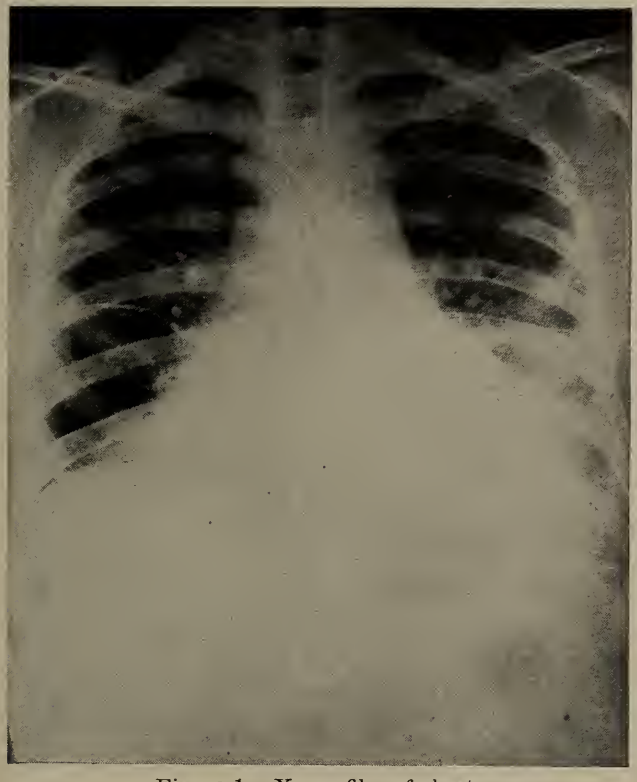

Figure 1.—X-ray film of chest.

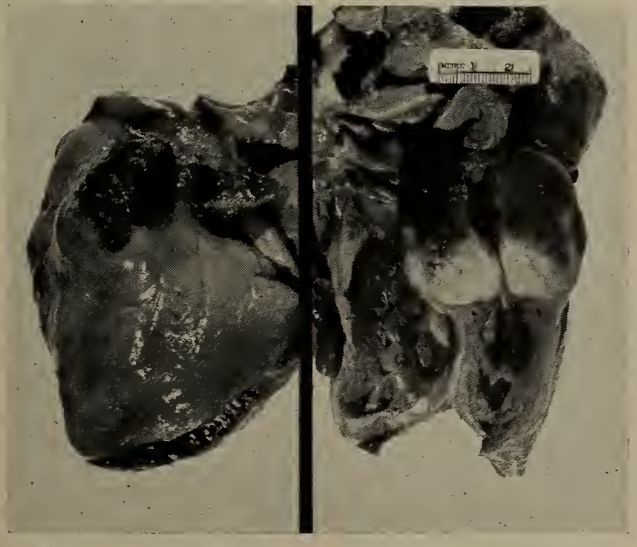

Figure 2.—*Left:* Neoplasm in right auricle with ulceration of its epicardial surface. *Right:* Hemisection through tumor showing hemorrhagic upper segment and the grayish yellow lower part with extension toward the insertion of the tricuspid valve.

On the fourth hospital day the patient became progressively more dyspneic. Left thoracentensis was performed, and 500 cc. of clear straw-colored fluid, with a specific gravity of 1.012 and a total protein content of 1.8 gm. per 100 cc., was removed. A right thoracentesis yielded 1,050 cc. of similar fluid. Later, left thoracentesis was repeated and 350 cc. of fluid was drawn. Mild syncope followed the procedure. At the conclusion the pulse rate was 86 per minute and the blood pressure 102 mm. of mercury systolic and 60 mm. diastolic. Although apprehensive, the patient was less dyspneic.

The patient died on the fifth hospital day after a night of progressively increasing dyspnea.

The patient was afebrile during his entire hospital stay.

At autopsy, seven hours after death, the only abnormalities noted on external examination were diffuse cervical edema typical of "bull neck" with distention of the cervical veins. No peripheral edema was present.

The pericardium was tautly distended with 1,150 cc. of bright red fluid having specific gravity of 1.030, which arose from the ulcerating, necrotic, deep red surface of a tumor mass in the body of the right auricle (Figure 1). The growth at its base measured 3 x 5 cm. and at its necrotic apex was 2 x 2.5 cm. The endocardium of the right auricle above the neoplasm was normal, but cutting 2 mm. into the endocardium of this area exposed the yellowish color of the tumor parenchyma. The right auricle was not dilated and the appendage was normal. The heart, with the growth, weighed 320 gm. Valve leaflets and chorda tendineae were normal. Valve circumferences were: Mitral 9 cm., aortic 7 cm., pulmonic 6.5 cm., and tricuspid 11 cm. The left ventricular wall measured 13 to 15 mm. and the right 2 to 5 mm. The chambers were not dilated. Coronary arteries were normal. Section through the long axis of the tumor showed it to be limited entirely to the auricular myocardium with extension to the insertion of the tricuspid valve (Figure 2). The tumor measured 3 x 5.5 cm. The inferior 2 x 3 cm. area of neoplasm consisted of grayish yellow material of firm consistency. The tissue above this was deep red in color and of mushy consistency. There was no evidence of metastasis of the tumor to other areas in the myocardium or to other organs.

Each pleural cavity contained 1,100 cc. of straw-colored fluid. The right lung weighed 1,050 gm. and the left 900 gm. The left lower lobe sank on immersion in water. Yellowish, foamy edematous fluid filled the tracheobronchial tree. The cut surface of the lung parenchyma was deep red in color, with rolled edges, and the surface still glistened after scraping. The lower border of the liver was at the costal margin and the organ weighed 1,400 gm. It was normal on the surface. On section it was noted to be grayish brown with increased lobular markings. No abnormalities were noted in gross and microscopic examinations of brain, meninges, thyroid, adrenal and pituitary glands, testes, entire gastrointestinal tract, pancreas, biliary system, kidneys, bone marrow, psoas muscle, rectus, and sternocleidomastoid muscles.

The parenchyma of the tumor consisted of moderately anaplastic pleomorphic spindle-shaped cells with deeply basophilic pleomorphic nuclei. The cells were loosely packed and tended to grow in parallel chains (Figure 3). Nuclei were not prominent. Lymphocytes infiltrated between some cords of neoplastic cells. In other areas clumps of lymphocytes were present. The growth at its margin invaded between normal muscle fibers. Scattered areas of fibrosis were present throughout. The central part contained areas of necrosis with polymorphonuclear and mononuclear infiltration. There were rare giant cells present which did not contain concentric striations. The upper part

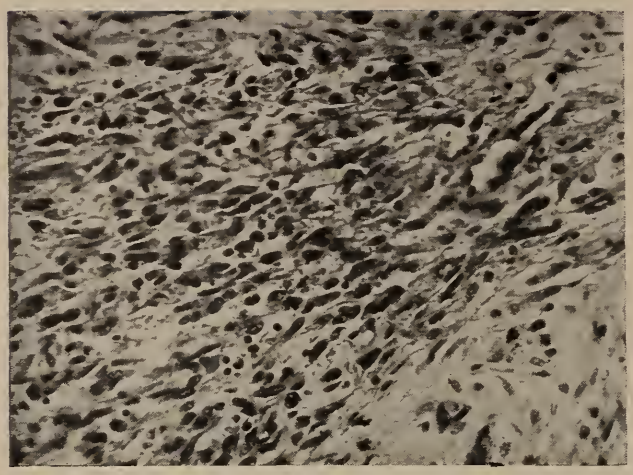

Figure 3.—Section through parenchyma of tumor showing spindle-shaped cells and fibrous stroma.

Figure 4.—Hemangiomatous upper section of tumor.

of the lesion was very vascular and resembled a hemangioma (Figure 4). Several tumor thrombi invaded the veins (Figure 5). With Von Gieson stains the tumor cells appeared yellowish pink and there was no connective tissue between them. There were moderate amounts of argentaphilic fibers about the tumor-cell bundles. No transverse striations were noted on Von Gieson stained specimens nor when hematoxylin and eosin, phosphotungstic acid and hematoxylin, or polaroid microscopy were used. Longitudinal fibrils were not demonstrated by phosphotungstic acid and hematoxylin stain. Patchy bronchopneumonia and pulmonary edema were noted upon section of the lungs. There was central congestion with atrophy of central liver cells and hemosiderin pigmentation in them.

DISCUSSION

Spindle-shaped cells such as made up the tumor parenchyma in this case are commonly noted in the reports of rhabdomyosarcoma of the heart, and giant cells are also common in this condition. The presence of tumor thrombus in the vein is characteristic of sarcomata. The giant cells in peripheral muscle rhabdomyosarcoma, however, have concentric striations, which were not found in the case here reported.

The Los Angeles Tumor Registry interpreted the neoplasm as being a "spindle-cell sarcoma in the right auricle."

Figure 5.—Tumor thrombus in vein.

Concerning the diagnosis of rhabdomyosarcoma, MacCollum, as quoted by Larson and Sheppard,[3] stated very aptly: "Since the criterion demanded before an origin from muscular tissue will be admitted is the demonstration of characteristic cross-striations, it is not at all improbable; indeed it is almost certain that many tumors truly of such origin or character are not recognized as such, and are relegated to the tumor scrap heap of sarcoma."

SUMMARY

In a case of spindle-cell sarcoma in the right auricle there was some suggestion that the tumor was of muscle origin.

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Hematuria Following Ingestion of Pyribenzamine Hydrochloride

Report of a Case

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WITH the widespread use of antihistaminic drugs, reports of toxic side-reactions have been increasing. Gastrointestinal and cerebral reactions predominate. In one of the most recent reports, Wolfson[3] noted urinary system disturbances following ingestion of pyribenzamine hydrochloride, with no gastric or cerebral reactions. In that case, the symptoms of diminishing urinary stream and increased bladder pressure, in the absence of any abnormalities in the urinary elements, indicated transient obstruction, probably in the region of the bladder neck.

A patient observed by the author had gross blood in the urine, associated with bladder pain, frequency and nocturia, after taking pyribenzamine hydrochloride.

CASE REPORT

A white male, aged 32, had been under observation and treatment for six months for chronic, non-specific prostatitis. Complete studies had indicated that there was no disease in the kidneys, as evidenced by normal intravenous pyelograms. In cystourethrograms taken several months before no abnormalities had been noted. In an effort to clear the prostatic infection, foci elsewhere were searched for. Chronic ethmoid sinusitis was present; and an otolaryngologist who, in consultation, diagnosed the condition as of allergic origin, treated the patient with sinus washings and then advised pyribenzamine hydrochloride in doses of 50 mg. four times a day. Two days after treatment with the antihistaminic agent was started, gross hematuria occurred. Associated with it were bladder pain, frequency of urination every 20 minutes during the day and hourly at night. The urine was grossly rust-colored, the reaction to a chemical test for blood was strongly positive, and innumerable erythrocytes per high-power field were noted in microscopic examination. Upon physical examination, no other toxic side-reactions were noted and no other condition that might cause the bleeding. The urethra and prostate were normal to palpation, as were the vesicles. Tenderness in the bladder was noted on deep palpation. The pyribenzamine was discontinued and urinary sedatives and antispasmodics were given. The following day, the bleeding was considerably diminished, but the urine still contained 50 to 60 erythrocytes per high-power field. There were no leukocytes. Reaction to a test for blood was 3+, and for albumin 2+. Within five days the symptoms had fully abated and the urine was microscopically normal.

DISCUSSION

The case reported is another in which urinary disturbances were noted following administration of pyribenzamine hydrochloride. In the previously reported case,[1] dysuria and increased frequency ceased in one day following discontinuance of the drug. In the present case, however, there was true hemorrhagic cystitis without actual infection. The mechanism was probably purely an irritative phenomenon. The author believes it likely that the excretion of the drug in the urine, in sensitive subjects, causes edema and exudation of the bladder mucosa, especially in the trigone region, much in the way that the formaldehyde of urotropin breakdown causes these conditions in the bladder of sensitive subjects. Wolfson[3] in his report indicated that "the antihistaminic may possess a spasmogenic property heretofore unrealized."

It would seem to be worth while for physicians giving pyribenzamine hydrochloride to question patients more frequently and more carefully with regard to urinary discomforts so that these complications may be avoided.

SUMMARY

The case reported is one in which gross blood appeared in the urine, with frequency, nocturia and bladder pain, following ingestion of pyribenzamine hydrochloride.

9615 Brighton Way.

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Familial Occurrence of Polycythemia and Leukemia

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THE existence of polycythemia in two or more members of a single family has been reported by several observers, and in 1933 the cases previously reported in the literature were reviewed by Spodaro and Forkner,[15] who found six studies of what they believed to be proven familial polycythemia. These examples are cited briefly below.

Bernstein[2] described a polycythemic patient whose son had an erythrocyte count of 7.5 million and whose father, who died at the age of 47, had had a high color. In a family reported upon by Doll and Rothschild,[5] five members had Huntington's chorea; two of the five also had erythrocyte counts of six million or over, and one had hypertension. Another member also had hypertension, and the erythrocyte count was five million. Engelking[6] described polycythemic traits in three generations of a family; in the last generation, six of 13 children had erythrocyte counts ranging from 8 million to 13.6 million with hemoglobin value between 140 per cent and 185 per cent. In two the spleen was palpably enlarged, and in three there was clubbing of the fingers. Infantilism was coexistent with polycythemia in five of the children. Kretschmer[10] recorded polycythemia in three children in a single family. The father was not examined, but the mother was normal. In two of the three children, the clubbing of the fingers and toes and the cardiac findings led to suspicion that the polycythemia was secondary to congenital heart lesions. In the other instances, no such associated constitutional abnormalities were present. Tancré[16] reported a patient with an erythrocyte count of 14.2 million, hemoglobin value of 17.8 per cent and leukocyte count of 18,300. This patient had a sister with erythrocyte count of 6.1 million but no symptoms. Weil and Stieffel[18] described a patient with erythrocyte count ranging from 5.5 million to 7 million and hemoglobin values from 115 per cent to 130 per cent. Cyanosis of the lips and extremities was noted, and the liver and spleen were palpably enlarged. The patient's brother was cyanotic, and the erythrocyte count was 6.44 million. He had no symptoms, and the liver and spleen were not enlarged.

In addition to a review of the previously reported cases of familial polycythemia, Spodaro and Forkner[15] described a family in which splenomegaly as well as high erythrocyte

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counts (average 5.98 to 7.8 million) was observed in four members of the ten studied. Another member of the family had an enlarged spleen but normal erythrocyte count, and three other members had elevated erythrocyte counts (average of 5.92 to 6.91 million) but no enlargement of the spleen. The benign course of the disease, absence of leukocytosis, and the normal hemoglobin values and basal metabolic rates in all the patients in the family led Spodaro and Forkner to conclude that the condition differed from polycythemia vera, and they suggested the term "benign familial polycythemia."

In 1939, Nadler and Cohn[14] again reviewed the literature and in addition reported upon a family that they had studied in which four of 11 children had erythrocyte counts from 7.48 million to 8.8 million with hemoglobins from 21 gm. to 24.3 gm. per 100 cc. and packed red cell volume of 61 per cent to 69 per cent of the whole blood. The mother stated that these four children had had "red faces" since birth. There was no evidence of factors which might initiate secondary polycythemia. There was no hypertension, and in only one case was the spleen (barely) palpable. One child had Little's disease. All four children had abnormally high blood volume—from 95 cc. to 133 cc. per kilogram of body weight.

Thus, there seem to be eight authentic examples of familial polycythemia reported in the literature. Other investigators have described conditions which they thought were familial polycythemia, but insufficient evidence is given to establish the disease as familial, or the clinical and hematological data do not definitely point to this diagnosis.

Many instances of leukemia in two or more members of a single family have been reported, and the question of genetic factors has been discussed.[1, 4, 17] Videbaek[17] in 1947 reviewed the 26 reported instances of "apparently incontrovertible" familial leukemia, and added his own report of 13 families, making a total of 39 families in which the disease occurred in two or more members. Certainly it is rarely possible to find familial tendencies when study is made of a large number of patients with leukemia. In the authors' experience during the past 15 years with over 500 patients with leukemia, evidence of leukemia in immediate or distant relatives was found in only three or four families.

A review of the literature revealed four instances of both polycythemia and leukemia in a single family. Guggenheimer[7] reported the case of a patient with polycythemia whose mother died of leukemia. Gutzeit[8] reported a case in which a patient with polycythemia had a son who was treated for a "definite" lymphatic leukemia. In a case of polycythemia reported by Halse,[9] the patient's uncle died of leukemia. Videbaek[17] observed a patient with leukemia whose aunt was under treatment for polycythemia. In addition to the family reported in this presentation, the authors have under observation two other patients with polycythemia vera who have sisters who apparently died of leukemia. Otherwise, in a study of approximately 150 patients with polycythemia vera, there have been no other authentic examples of polycythemia or leukemia in close relatives.

In the family here reported upon, three of the members were referred for treatment of definite blood dyscrasia, and the mother had symptoms strongly suggestive of polycythemia. Other members of the family, unfortunately, were not available for study. Of the three patients studied, one had an established diagnosis of myelogenous leukemia which proved fatal three years later, and two had symptoms and physical and laboratory findings which were typical of polycythemia vera.

CASE REPORTS

Case 1: A white housewife, aged 57, was well until September 1940, when she became aware of undue fatigue, slight loss of weight, and pain in the left leg at the site of rather large varicose veins. She entered a hospital for vein ligation, and in the course of a complete examination an abnormal blood picture typical of myelogenous leukemia was noted.

Prior to the onset of the symptoms described, the patient had been in excellent health. Five babies were delivered normally, and the children had no known blood abnormalities. In 1933, at the age of 50, menorrhagia developed, but after a uterine curettage a normal menstrual cycle was resumed until at age 52 menorrhagia developed again. Dilatation and curettage then were followed by complete cessation of menses, and the patient semed to be in good health until the onset of symptoms in 1940.

Family history. The mother died at the age of 78 of cardiovascular disease. During the last three years of her life she had had burning pain on the plantar surfaces of the toes with a bluish-red discoloration aggravated by exercise or heat and relieved by exposure to cold. The patient's father died at the age of 91 of causes incidental to age. There were 15 children in all. One brother, aged 67, now dead (see Case 2), had a known diagnosis of polycythemia, and a second brother had cardiovascular disease. A third brother had diabetes, an erythrocyte count of over 6 million, and hypertension which was treated by venesections. Five other brothers are living and well. One sister has known polycythemia. Five other sisters are living and well.

A report of the physical examination of the patient stated that she was observed to be well developed and nourished, appearing to be about the stated age. Slight pallor was noted but the skin was free of rashes. There were small tonsillar tags but no mucous membrane hemorrhages. The pupils reacted normally, and the optic fundi were considered normal. The thyroid gland was small, and the cervical nodes were not enlarged. The heart and lungs were normal to physical examination. The blood pressure was 130 mm. of mercury systolic and 70 mm. diastolic. On abdominal palpation an enlarged spleen could be felt extending 2½ inches below the costal margin on deep inspiration. Axillary and inguinal nodes were small. The extremities were normal except for varicose veins. Results of pelvic and rectal examinations were essentially normal, as were results of neurologic examination. Hematologic studies at the time of the initial examination showed the following: Erythrocytes numbered 4.31 million, with 2.6 per cent reticulocytes; and the hemoglobin content was 12.8 gm. per 100 cc. Leukocytes numbered 65,000 and platelets 2,517,000. The leukocyte differential was 2 per cent basophils, 35 per cent "C" myelocytes, 8 per cent "B" myelocytes, 2 per cent "A" myelocytes, 12 per cent metamyelocytes, 3 per cent band cells, 28 per cent segmented cells, 6 per cent lymphocytes, 4 per cent monocytes, 2 plus anisocytosis, and 1 plus poikilocytosis.

The patient was referred for treatment with radioactive phosphorus, and therapy was initiated in January 1941, at which time the leukocyte count was 130,700. After nine months of moderately intensive therapy, a remission was induced.[11] The patient then remained well clinically and in good hematologic remission until September 1942, when anorexia, nausea and vomiting developed, and subsequently fatigue, neuralgic pains in the legs, night sweats, and loss of weight. The leukocyte count began to rise gradually and immature forms were increasingly evident in spite of continued therapy. The condition of the patient deteriorated steadily, increasing anemia developed and the patient died January 5, 1943.

* * *

Case 2: A male physician, aged 68 when first observed by the authors, was in good health until 1927, when the patient was 54 years of age. At that time a painful burning sensation in the toes developed, accompanied by bluish-red dis-

colorations and slight swelling. Soon thereafter, the patient noticed hyperesthesia, tenderness, and discoloration of the fingers. These symptoms were decreased in the winter and were considerably aggravated in hot weather. A diagnosis of erythromelalgia was made,[3] and symptomatic relief was obtained with the use of acetylsalicylic acid. In 1934, the diagnosis of polycythemia was made, and therapy during the next four years consisted of phlebotomies at infrequent intervals without striking relief of symptoms. On one occasion pulmonary embolism occurred ten days after venesection. In 1939, phlebotomies were carried out to lower the erythrocyte count to a normal level, and the patient was placed on phenylhydrazine therapy which was continued for three years with slight relief of symptoms.

The patient had had pneumonia and empyema at age 6. Hypertensive vascular disease, pulmonary emphysema, and left renal calculus had been diagnosed before the patient was observed by the authors, and gout had been a complicating factor since 1930.

(The family history was described in Case 1.)

Upon physical examination the patient was observed to be pale and chronically ill. No lesions of the skin or mucous membranes were observed, and there was no lymph node enlargement. The cardiac outline was at the upper limit of normal size with a silhouette sugggestive of left ventricular hypertrophy. The blood pressure was 180 mm. of mercury systolic and 88 mm. diastolic. The heart rhythm was regular, and the rate normal. No murmurs were heard. The lungs were clear to auscultation. The spleen tip was palpable five finger-breadths below the costal margin on the left, and the liver edge extended four finger-breadths below the costal margin on the right. No cyanosis, edema, or clubbing were noted in the examination of the extremities. Hematologic studies revealed the following: Erythrocytes numbered 7.62 million, with hemoglobin 11.7 gm. per 100 cc.; leukocytes numbered 46,000, and platelets 450,000. The packed red cell volume was 40 per cent of the whole blood. The urine contained albumin (4+), four to seven erythrocytes per high-power field, numerous leukocytes, and occasional hyaline casts. The non-protein nitrogen content per 100 cc. was 50 mg., the uric acid content 10 mg. and the oxygen saturation 90 per cent.

Therapy with radioactive phosphorus[12] was begun in June 1942, and 20 millicuries was given over a period of two months. This was followed by definite subjective improvement with a disappearance of symptoms of both erythromelalgia and gout. The spleen decreased almost to normal in size and a progressive fall in the erythrocyte count from 7.62 million to 5.25 million was observed over a period of six months. During this time, the leukocyte count fell from 46,000 to 4,250. Additional P^{32} was given in 1943, 1944, and 1945, and a normal hematologic picture was maintained. During this time the subjective symptoms were minimal as long as the blood picture was kept within normal limits.

In 1945, nephrectomy was done on the left side because of abscess formation secondary to the kidney stone. Convalescence was uneventful, but elevation of the non-protein nitrogen level persisted. The course was gradually but progressively downhill until the patient died in uremia on June 22, 1947, at the age of 74. Necropsy was not done.

* * *

Case 3: The patient, a woman 54 years of age, first noticed dryness and intense itching of the skin in 1924 at the age of 38. In 1934 polycythemia was diagnosed and a correlation was noted between the severity of the pruritus and the number of erythrocytes in the blood. When the erythrocyte count was kept at the level of approximately 5 million by phlebotomies, the symptoms were ameliorated, although not relieved completely. X-ray therapy had never been used. More recently the patient had noticed small scattered purpuric spots over her body. Histamine injections, histaminase tablets, vitamin preparations, potassium chloride, and theelin in oil were tried at various times but did not relieve the symptoms. Previously the patient had been in good health. Thyroidectomy and tonsillectomy were uneventful, and three pregnancies were normal. The children are all well.

(The family history was described in Case 1.)

Upon physical examination, Feb. 11, 1941, rough, scaling, fissured skin lesions of eczematoid type, as well as scattered purpuric lesions, were noted. The tongue was serrated and reddened. The heart was enlarged slightly to the left. The blood pressure was 180 mm. of mercury systolic and 80 mm. diastolic. There was a blowing systolic murmur at the base of the heart. The abdominal musculature was relaxed; the spleen and liver could not be palpated.

Laboratory data, Feb. 11, 1941, were as follows: Erythrocytes numbered 5.01 million; the hemoglobin value was 76 per cent; leukocytes numbered 21,900. Therapy with phlebotomies was withheld and on Sept. 12, 1941, the erythrocyte count was 8.63 million, the hemoglobin value 111 per cent (15.3 gm. per 100 cc.), the platelet count 1,329,000, and the leukocyte count 27,900 with a normal cell differential.

Therapy with radioactive phosphorus[12] was begun with an initial dose of 6.9 millicuries Sept. 15, 1941. The blood cell counts gradually returned to normal and the hematologic remission continued until December 1943, when the cell counts were as follows: Erythrocytes 8.64 million with hemoglobin value of 118 per cent; leukocytes, 13,050. Packed cell volume was 62 per cent of the whole blood. During this time the pruritus had been greatly improved, although it was not completely eliminated. The patient was treated again with P^{32} in 1944 (6 millicuries in January and 7 millicuries in February), and complete hematologic remission was again induced. The itching lessened but was present to an annoying extent for several months before the blood cell counts rose again to polycythemic levels. On June 11, 1946, the results of blood examination were: Erythrocytes, 6.38 million; hemoglobin value 122 per cent (17.7 gm. per 100 cc.); leukocytes, 15,700; packed cell volume 55.8 per cent. At that time the spleen was palpable three finger-breadths below the left costal margin. Examination of sternal marrow revealed hyperplasia of the erythropoietic system with a Myeloid Erythroid ratio of 1.6:1. The oxygen saturation was 97 per cent. After several venesections, the blood cell counts on Oct. 25, 1946, were as follows: Erythrocytes, 7.8 million, with hemoglobin value 86 per cent; leukocytes, 18,550. Administration of 4 millicuries of P^{32} in December 1946 brought about a temporary drop in the blood cell counts, and additional P^{32} (3.2 millicuries) was given in July 1947, followed by a satisfactory remission and great improvement in clinical symptoms.

Comment: The case of myelogenous leukemia described in this instance presented no unusual features. The brother and sister were thought to have true polycythemia, and the absence of intense redness or cyanosis of the skin was attributed to the fact that each patient had been treated previously with phlebotomies and had small hypochromic red cells when first observed by the authors. In each case, the erythrocytosis was associated with leukocytosis and elevated platelet count. The hematocrit values were normal in each instance as a result of previous repeated bleedings, and the reticulocyte counts were never significantly elevated. The spleen was palpably enlarged in each case, but in one case (Case 2) the splenomegaly was a constant feature, whereas in Case 3 the spleen was palpable during active phases of the disease, but was not palpable when the disease was in hematologic remission.

It is unfortunate that all members of the family could not be studied even though they had no symptoms suggestive of blood dyscrasia. Only the mother had a history compatible with the diagnosis of polycythemia, and her symptoms of erythromelalgia were almost identical to those of the second patient in whom a definite relationship existed between these symptoms and the elevated erythrocyte count.

The cases reported herein differ considerably from those of so-called "benign familial polycythemia" described by Spodaro and Forkner[15] in regard to the severity of symptoms necessitating intensive therapy, as well as the presence of other features commonly seen in association with polycythemia vera, namely, the leukocytosis, the high platelet count, and in one instance, gout and erythromelalgia.[3] The occurrence of two cases of polycythemia vera and one case of leukemia in a single family is of particular interest in the light of the high incidence of leukemia occurring as a complication of polycythemia rubra vera[12, 13] and because so few reports of the occurrence of both polycythemia and leukemia in a single family were found in the literature.

SUMMARY

There are eight authentic examples of familial polycythemia and 39 instances of familial leukemia reported in the literature, but the authors found only four instances of the occurrence of both polycythemia and leukemia in the members of one family.

In the family studied by the authors, two cases of polycythemia and one case of myelogenous leukemia in a brother and two sisters are reported. The possible existence of polycythemia in an earlier generation of the family could only be conjectured.

The two patients diagnosed as having polycythemia had typical features of polycythemia vera and responded well to radioactive phosphorus therapy.

The authors wish to thank Dr. J. C. Hayward for providing valuable information concerning the details of the family history of these patients, and Mrs. Nancy R. Durning for her assistance in checking literature and gathering data for this report.

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EDITORIAL

Hospitals — With Whose Money?

The Council of the California Medical Association has devoted much time in recent years to discussions of the pros and cons of building hospital facilities with public or with private funds. On two occasions the Council has directed the attention of the county medical societies to some of the cautions which should be observed before local societies or physicians succumb to the lure of "free money" for hospital construction.

Gist of the Council's twice-repeated suggestions has been that public funds for hospital construction should be used only as a last resort after all sources of private funds have been investigated and found unavailable.

Confirmation of the Council's attitude has just been furnished in a progress report of the Association's Committee on Rural Medical Service, which has been looking things over, including rural hospitals, in several areas of California. Without entering into the political or professional staff membership aspects of hospitals built wholly or partially with public money, the committee has uncovered some startling physical features in at least two such institutions.

One hospital recently completed a 28-bed addition of general beds and a maternity unit. Included in the maternity section is a completely-equipped obstetrical surgery, costing about $25,000, which is to be used only for obstetrical cases. Designed to eliminate contamination, such a surgery might be an understandable feature of a large hospital. However, on the basis of about 250 deliveries per year in this hospital, and allowing for about five per cent cesarean deliveries, this costly feature will be used only a few times each year. Of course, it will be available for circumcisions, which are not generally considered as requiring special facilities, even in large hospitals.

In another hospital, built with governmental funds, a 32-bed institution has been completely equipped with a modern laundry, which to date has not been used. If the unit were put into operation, the salaries of the operating personnel would cost two and one-half to three times the present laundry bill, using outside service. Here it is obvious that the taxpayers' money will lie dormant for an indefinite period, especially with the hospital census running 50 to 60 per cent.

In contrast to these two hospitals, the committee has surveyed a 25-bed hospital which was built entirely from private funds and used public money only in a small amount for equipment. In this instance a workable, although somewhat unusual, plant design has kept the hospital cost to a minimum and has permitted a highly successful and satisfactory operation for more than a year.

The committee's report summarizes the rural hospital construction situation by suggesting that local conditions and requirements should be the principal guides in building rural hospitals and that professional help in architecture, equipment and planning be called upon as supplementary aids only where local resources are not available. The report also suggests that governmental requirements in planning and construction may account for at least a part of the inefficient features or facilities of some of the hospitals built in whole or in part with public funds.

The Council's suggestion to "Stop — Look — Listen" may well be reiterated.

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NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 375th Meeting of the Council, Los Angeles, September 9, 1950.

The meeting was called to order by Chairman Shipman in the Biltmore Hotel, Los Angeles, at 9:30 a.m., Saturday, September 9, 1950.

Roll Call:

Present were President Cass, President-elect MacLean, Speaker Alesen, Vice-Speaker Charnock, Councilors Ball, Crane, Dau, Ray, Montgomery, Lum, Pollock, Green, West, Thompson and Shipman and Secretary Daniels. Absent for cause, Councilors Heron, Henderson and Frees, Editor Wilbur.

A quorum present and acting.

Present by invitation during all or part of the meeting were Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Field Secretary Clancy, Legal Counsel Hassard, Messrs. Clem Whitaker, Jr., James Dorais and Ned Burman of public relations counsel, Mr. Ben H. Read of the Public Health League of California, county society executive secretaries Wood of San Mateo, Donovan of Santa Clara, Cochems of Los Angeles, Young of San Diego, Tobitt of Orange, Waterson of Alameda, Gillette of Fresno and Venables of Kern; Malcolm Merrill of the State Department of Public Health; Lester Lawrence, secretary of the Alameda County Medical Association; Thomas F. O'Connell of the San Diego Blood Bank, and Drs. John Ruddock, John R. Upton, C. A. Broaddus, Francis J. Cox, Justin J. Stein and Christopher Leggo, appearing in behalf of standing or special committees of the Association or the Council, as listed in these minutes.

1. *Minutes for Approval:*

(a) On motion duly made and seconded, minutes of the 374th Council meeting, held May 27, 1950, were approved.

(b) On motion duly made and seconded, minutes of the 222nd Executive Committee meeting, held June 15, 1950, were approved.

(c) On motion duly made and seconded, minutes of the 223rd Executive Committee meeting, held August 10, 1950, were approved.

2. *Membership:*

(a) A report of membership as of September 1, 1950, was received.

(b) On motion duly made and seconded, five members whose 1949 dues had been received since May 27, 1950, were reinstated to membership.

(c) On motion duly made and seconded in each instance, five applicants were elected to Associate Membership. These were: James T. Duncan and James C. Malcolm, Alameda County; Marshall J. Fiese, Fresno County; Manuel Kalman, Marin County; Erwin P. Brauner, Orange County.

(d) On motion duly made and seconded, Walter Christiansen of Los Angeles County was elected to Life Membership.

(e) On motion duly made and seconded in each instance, four applicants were elected to Retired Membership. These were: A. Russell Moodie, Kern County; Morris W. Haworth, Sacramento County; Wm. Palmer Lucas, San Francisco County; Clarence Tyley Roome, Santa Barbara County.

(f) On motion duly made and seconded in each instance, reductions in dues were granted to seven applicants because of illness or postgraduate studies.

3. *Blood Bank Commission:*

John R. Upton, chairman of the Blood Bank Commission, reported on the status of the statewide plan of blood banks, stating that seven banks are now in operation, two others about to start and several others in various stages of planning. He also reported that a reciprocity agreement had been reached between the commission and the American Red Cross, to permit the exchange of blood on mutually acceptable terms between community and Red Cross blood banks.

Francis E. West reported on the San Diego Blood Bank, which has been incorporated to take over the operations of the former blood bank maintained under the auspices of the county medical society, the city-county government, the Navy and the Red Cross. He reported that for the first year of operation the new blood bank estimated a total cost of $71,480, exclusive of cash receipts. He stated that

the San Diego County Medical Society could advance $10,000 toward this total cost and that a loan of $10,000 additional would be made by the Doctors Business Bureau in that county.

John W. Green, a member of the A.M.A. Blood Bank Commission, reported on a recent Washington meeting between the A.M.A. commission, the American Red Cross and several government agencies. He also presented a resolution for Council consideration (see below).

Dr. Upton requested the advance of $3,500 to cover the cost of bottles and tubing for blood banks in Sonoma and Eureka ($750 each) and San Diego ($2,000), to provide a three-month supply. On motion duly made and seconded, this advance was voted.

On motion duly made and seconded, Dr. Green's resolution was adopted. This reads as follows:

WHEREAS, The California Medical Association through its Blood Bank Commission has evidenced its wish to furnish adequate blood to our citizens when needed at an economical, non-profit level, and

WHEREAS, A reciprocal agreement with the Pacific Area Office of the American Red Cross is now under consideration to enhance the effectiveness of the mutual high purposes of this commission and the American Red Cross, and

WHEREAS, The local county medical societies are considered the best judges of what will best serve their communities in this regard, by both the California Medical Association and the American Red Cross, and

WHEREAS, The recent decision of the San Diego County Medical Society to authorize a community non-profit blood bank under the auspices of the Blood Bank Commission of the California Medical Association for their area has apparently not been accepted as final by either the Pacific Area Office or the San Diego chapter of the American Red Cross, now, be it here

Resolved: That the Pacific Area Office of the American Red Cross be requested to reaffirm the policy of the National American Red Cross in 1948 with the American Medical Association regarding local county medical society decisions as to their blood bank facilities and to so communicate this reaffirmation to the San Diego Chapter of the American Red Cross, and, be it further

Resolved: That such reaffirmation will be regarded by the California Medical Association as an indication of the efficiency and good faith to be expected in the Reciprocity Agreement now under consideration and that voluntary aid from the San Diego chapter of the American Red Cross will, if needed, be authorized for the benefit of the San Diego Blood Bank program under the terms of the proposed reciprocal agreement when mutually ratified.

On motion duly made and seconded, and amended to increase the amount from $30,000 to $50,000, the Council voted to lend $50,000 to the San Diego Blood Bank, without interest, to assist it in starting its program. This loan supersedes the previous authorization of $12,000. Terms of repayment are to be arranged by the Executive Committee and legal counsel, in accordance with the Council resolution of May 27, 1950.

At this point Dr. Albert C. Daniels was introduced by the chairman as the new Secretary-Treasurer of the Association, appointed by the Executive Committee and confirmed by vote of the Council.

4. *Committee on Industrial Accident Commission:*

Dr. Francis J. Cox, chairman of the Committee on Industrial Accident Commission, reported on the meeting held between his committee and the negotiating committee of compensation insurance carriers. The Council thanked Dr. Cox for his report and requested that he prepare a summary of it for publication in the official journal.

5. *State Department of Public Health:*

Dr. Malcolm Merrill reported to the Council on (1) the activation of the Crippled Children's Advisory Committee, which has now met, (2) the meeting of the committee on the proposed Morbidity Study, and (3) the agreement to have medical representation on the State Disaster Council.

6. *Committee on Industrial Health:*

Dr. Christopher Leggo, chairman of the Committee on Industrial Health, presented a proposed statement of principles for the guidance of industrial nurses and their employers. After discussion, it was moved, seconded and voted to table action on this statement pending further clarification of the principles involved by the committee.

7. *Advisory Planning Committee:*

Mr. Hunton, chairman, reported that the Advisory Planning Committee had met the preceding day. The committee had adopted a resolution calling for scientific approach to the problem of individual physician-patient relationships, on which future reports would be made.

8. *Committee on Associated Societies and Technical Groups:*

A report of the committee on Resolution No. 19 of the 1950 House of Delegates was read. The report recommended that psychologists, through their professional society, prepare a list of qualified psychologists to work under the direction of physicians, that such list be made available to physicians but not to the public, and that such list be subjected to critical review at annual intervals. On motion duly made and seconded, the report of the committee was approved.

9. *Committee on Hospitals, Dispensaries and Clinics:*

On motion duly made and seconded, it was voted to accept, with regret, the resignation of Dr. John C. Sharp as a member and chairman of the Committee on Hospitals, Dispensaries and Clinics. It was regularly moved, seconded and voted to appoint Dr.

Howard Miles of Salinas as a member of the committee to succeed Dr. Sharp and to name Dr. Francis E. Jacobs of San Diego as chairman.

10. *Committee on Public Health and Public Agencies:*

Dr. Thompson, at the request of Dr. Alesen, chairman, discussed the use of public funds for hospital construction. Dr. West reported that an early meeting had been arranged for the consideration of the question of physicians accepting fees for care of patients whose expenses were being borne by national organizations which rely on public financial support.

11. *Committee on C.P.S. Administrative Matters:*

A report from the Committee on C.P.S. Administrative Matters was read and discussed. The report urged creation of a committee of C.M.A. officers (President as chairman, President-elect, speaker, Council chairman, legislative chairman) to serve as a liaison committee, together with the President of the C.P.S. trustees and two members to be elected by the House of Delegates, with C.P.S. trustees in an advisory body on matters of policy or economic import. On motion duly made and seconded, the report was approved.

12. *Committee on Emergency Medical Service:*

Dr. Justin J. Stein, chairman of the Committee on Emergency Medical Service, reported on the activities of the committee and stated that he had been appointed chairman of a state advisory committee to the State Disaster Council and had attended several meetings of that body. Dr. Stein was praised by the chairman for the work of his committee.

13. *Committee on Postgraduate Activities:*

Dr. John Ruddock, chairman of the Committee on Postgraduate Activities, reported that five two-day institutes were planned for the fall and winter season, together with numerous one-day conferences in other locations. For the two-day institutes he requested authority to establish a registration fee of $5 as a means of increasing interest in the institutes. On motion duly made and seconded, this recommendation was approved.

14. *Cancer Commission:*

(a) On motion duly made and seconded, it was voted to approve the employment by the Cancer Commission of Dr. Franklin C. Hill as medical director.

(b) On motion duly made and seconded, it was voted to approve the purchase by the State Department of Public Health of films produced by the American Cancer Society on self-examination of the breast, these films to be used for lay education and to be handled by the California Division of the American Cancer Society in accordance with terms agreed upon by the Cancer Commission.

15. *Hospital Staff Meetings:*

A letter from the Alameda County Medical Association, relative to compulsory attendance at hospital staff meetings, was read and discussed. On motion duly made and seconded, it was voted to refer the matter to the Committee on Associated Societies and Technical Groups.

16. *California Physicians' Service:*

Dr. Kendrick Smith, representing the C.P.S. Trustees, reported to the Council on the financial position of C.P.S. He stated that the only contract which is not now paying its own way is the two-visit deductible medical rider and that steps are being taken to revise this contract to make it self-supporting. Dr. Cass requested that the delegates to the A.M.A. be instructed to introduce a resolution asking the Council on Medical Service of the A.M.A. to restate its position in approving medically-sponsored prepayment plans. On motion duly made and seconded, it was voted to instruct the A.M.A. delegates accordingly.

17. *Interim Session of House of Delegates:*

Discussion was held as to the subjects to be included in the call of the interim session of the House of Delegates scheduled for December 2 and 3, 1950. After considerable discussion it was regularly moved, seconded and voted that this session not be held, on account of the evident lack of suitable subjects to warrant its convention.

18. *Public Policy and Legislation:*

Dr. D. H. Murray, chairman of the Committee on Public Policy and Legislation, and Mr. Ben H. Read, executive secretary of the Public Health League of California, discussed the legislative situation, both state and national, and reported that a meeting had been scheduled with representatives of allied professional groups for the discussion of matterms of mutual interest.

19. *Student Nurse Recruitment:*

A request for a contribution to a fund to finance a campaign of student nurse recruitment was read, the request showing that some $4,660 had been contributed by other organizations, including the Association of California Hospitals and several nursing groups and hospitals. On motion duly made and seconded, it was voted to appropriate $1,250 to this fund.

20. *Legal Department:*

Mr. Hassard reported on several court decisions of interest to the Association.

21. *Alameda-Contra Costa Medical Association:*

Dr. Lum reported that the approval of the proposed by-laws by the members of the Contra Costa County Medical Society was the only necessary step in compliance with the authorization of the 1950 House of Delegates for issuance of a charter to the Alameda-Contra Costa Medical Association. It was regularly moved, seconded and voted that when this approval is secured and the charters of the two existing societies are surrendered, if possible, the secretary be instructed to issue a new charter to the combined society.

22. *World Federalism:*

On motion duly made and seconded, the following resolution was unanimously adopted:

WHEREAS, The California Medical Association has vigorously and successfully opposed recurring attempts to introduce socialized systems of medical care in California for many years, and

WHEREAS, The doctors of California have wholeheartedly supported the work of the American Medical Association in combating the politically-inspired threat of socialized medicine on a national scale, and

WHEREAS, American health and medical standards, achieved under the American free enterprise system, are vastly superior to those of the world's other civilized countries, in most of which the private practice of medicine has been virtually eliminated by socialistic governments; now therefore, be it

Resolved: That the California Medical Association record its opposition to the concept of world government under which the American system of free enterprise would be endangered by the majority rule of conflicting systems, and reject any and all current attempts to that end as premature and inconsistent with the forthright stand of California doctors of medicine against the socialization of medicine in America.

23. *Time and Place of Next Meeting:*

It was regularly moved, seconded and voted that the next meeting of the Council would be at the direction of the Executive Committee.

Adjournment:

There being no further business to come before the meeting, it was adjourned at 6:00 p.m.

SIDNEY J. SHIPMAN, M.D., *Chairman*
ALBERT C. DANIELS, M.D., *Secretary*

Executive Committee Minutes

Tentative Draft: Minutes of the 223rd Meeting of the Executive Committee, San Francisco, August 10, 1950.

The meeting was called to order by Chairman Lum in Room 218 of the St. Francis Hotel, San Francisco, at 3:00 p.m., Thursday, August 10, 1950.

Roll Call:

Present were President Cass, President-elect MacLean, Council Chairman Shipman, Speaker Alesen and Auditing Committee Chairman Lum; Assistant Secretary-Treasurer Montgomery. Present by invitation were Executive Secretary Hunton, Assistant Executive Secretary Wheeler, Legal Counsel Hassard, Mr. Ben Read, executive secretary of the Public Health League of California, and Dr. Albert C. Daniels, committee nominee for the office of Secretary-Treasurer.

1. *Financial:*

(a) It was regularly moved, seconded and voted to appropriate $2,500 to meet the expenses of the Interim Session of the House of Delegates, to be held December 2 and 3, 1950, in Sacramento.

(b) It was regularly moved, seconded and voted that the constitutional provisions regarding waiver of dues of members in military service be considered effective and to recommend to the Council, for its recommendation to the House of Delegates, the pro rata refund of 1950 dues to members called into service during the year.

It was regularly moved, seconded and voted that the county medical societies be informed of these steps and of the progress of plans for the recruitment of medical officers for the armed forces to date.

In response to a request from the Council on Emergency Medical Service of the American Medical Association, it was regularly moved, seconded and voted to make nominations for selection of a state chairman for a proposed procurement and assignment service. Several suggestions for such nominees were considered.

It was agreed that the county medical societies should be advised of current developments in regard to medical officer requirements for the armed forces.

(c) On motion duly made and seconded, it was voted to renew the subscription of $1,000 annually to the California State Chamber of Commerce.

2. *Committee on Emergency Medical Service:*

The committee reviewed the report of the Committee on Emergency Medical Service. It was regularly moved, seconded and voted that reprints of an article to appear in the *Bulletin of the Los Angeles County Medical Association* be purchased for distribution to members outside that area.

It was regularly moved, seconded and voted that the committee be authorized to purchase office equipment up to a value of $200.

It was the sense of the Executive Committee that the military and civilian aspects of emergency medical service be clearly separated.

3. *Committee on Advertising:*

(a) On motion duly made and seconded, it was voted to accept with regret the resignation of Dr. C. L. Cooley as a member of the Committee on Advertising and to name Dr. W. Dayton Clark to succeed to this appointment.

(b) On the matter of the use of physicians' names in the advertising of hospitals and sanatoria, it was regularly moved, seconded and voted to refer the question to the Committee on Hospitals, Dis-

pensaries and Clinics for study and an expression of opinion to the Council.

4. *Legal Department:*

(a) Mr. Hassard reported on certain activities of so-called health organizations and on motion duly made and seconded, it was voted to authorize him to proceed with the investigation of such groups.

(b) Mr. Hassard discussed several current court cases of interest to the Association and in one case concerning the question of expert testimony without the consent of the witness, it was regularly moved, seconded and voted to authorize him to appear on behalf of the Superior Court of San Francisco County.

(c) It was regularly moved, seconded and voted that Dr. Donald Cass be authorized to appear before an interim committee of the Legislature on August 28, to present a statement relative to nursing and that a pilot survey to determine the needs for nursing services throughout the state be taken for presentation to this committee at a later public hearing.

5. *Appointment of Secretary-Treasurer:*

The Executive Secretary reported on the returns from Councilors on an informal poll taken on the nomination of Dr. Albert C. Daniels for appointment as Secretary-Treasurer of the Association. It was agreed that the unanimous agreement of a quorum of the Council on this nomination should be considered as official approval and that the office be authorized to proceed on that basis.

6. *Time and Place of Next Council Meeting:*

It was agreed that the next meeting of the Council would be called for Saturday, September 9, at the Biltmore Hotel, Los Angeles.

Adjournment.

DONALD D. LUM, M.D., *Chairman*
M. LAURENCE MONTGOMERY, M.D.,
Assistant Secretary-Treasurer

C. M. A. Postgraduate Institutes

The California Medical Association through its Committee on Postgraduate Activities consisting of Dr. John C. Ruddock of Los Angeles, chairman, Dr. Carroll Andrews of Sonoma, Dr. Edward C. Rosenow, Jr., of Los Angeles, and (ex-officio) Dr. Albert C. Daniels of San Francisco, secretary of the C.M.A., is planning a new departure in carrying postgraduate instruction to physicians of the non-metropolitan areas of California. Dr. A. C. Broaddus of Stockton is the Director of Postgraduate Activities, appointed by the Association to formulate and carry out, as authorized by the committee, plans for more extensive postgraduate opportunities for all California physicians.

Each year postgraduate institutes are to be held in five or more widely separated regional centers where such opportunities are not at present available. The program for each institute will be arranged by a committee of the local medical society working with the director of the postgraduate department of one of the medical schools of Los Angeles or San Francisco. A registration fee of $5 will be charged entitling the registrant to attend one or all of the institutes of the season. Funds so collected will be used to bring in outstanding speakers from eastern centers as well as from medical schools in California.

The Santa Barbara Medical and Surgical Institute will meet October 12 and 13 in Santa Barbara at the Bissell Auditorium of the Cottage Hospital. (The program prepared by the local committee, Dr. H. V. Findlay, chairman, and Dr. H. M. Walton, chairman of the postgraduate extension work of the College of Medical Evangelists, is presented in detail under "News and Notes" of this issue.)

The Fresno Medical and Surgical Institute will be held on Thursday and Friday, November 2 and 3, at the Hotel Californian in Fresno. (This program is also shown in detail under "News and Notes" of this issue.) It was prepared by the local committee, Dr. C. S. Mitchell, chairman, cooperating with Dr. S. J. Weinberg of the University of California at Los Angeles.

Three other institutes are in preparation. The Riverside Medical and Surgical Institute will convene January 25 and 26 at the Mission Inn in Riverside. The program is being prepared by the local committee, Dr. Franklin B. Mead, chairman, working with Dr. Edward C. Rosenow, Jr., director, and Dr. Gordon E. Goodhart, associate director, of the Graduate Extension Division of the University of Southern California School of Medicine.

The Sacramento Society for Medical Improvement has named Dr. Herbert W. Jenkins chairman of a committee which is planning the Sacramento Medical and Surgical Institute with Dr. William Northway, assistant dean of the School of Medicine of Stanford University. This will be given February 8 and 9, 1951, in Sacramento.

The last program, the Santa Rosa Institute prepared by Dr. Stacey R. Mettier, director of the postgraduate department of the Medical School of the University of California in accordance with the wishes of Dr. William E. Rogers and his committee of the Sonoma County Medical Society, will be given March 8 and 9, 1951, in Santa Rosa.

All these institutes are open to any regular physician or surgeon of California who registers for any one of them. Plans are being made to get these institutes accepted for full university credit toward the requirements of the Academy of General Practice.

Questions and Answers about C. P. S.

Billing C.P.S. Is Simple

(Editor's Note: To answer questions about C.P.S. billing, this section is entirely devoted to the subject this month.)

Herewith is a reproduction of the C.P.S. Billing Form No. 9, the only form required to file a claim for services rendered by physician-members to a C.P.S. patient. Following are step-by-step instructions for completing the form. Printing or typing should be used for all answers.

PART I: At the time of the first visit, have the patient complete this section of the billing form—giving full name (as it appears on his C.P.S. membership card) and home address.

When the patient's income status is not known, have him check in the appropriate box whether his *gross family income* for the preceding year was over or under $3,600. The C.P.S. income provision is fully expained on the reverse of the last (pink) carbon.

If income is over $3,600, the doctor is entitled to charge the difference between the C.P.S. fee and his usual fee. Any such charges should be discussed *in advance* of rendering services in order to avoid the possibility of later misunderstanding.

If this income is under $3,600 the patient may not be charged in addition to the fee paid by C.P.S. to the physician-member—except for such services as are not covered by the patient's contract.

Space is provided for the patient's signature.

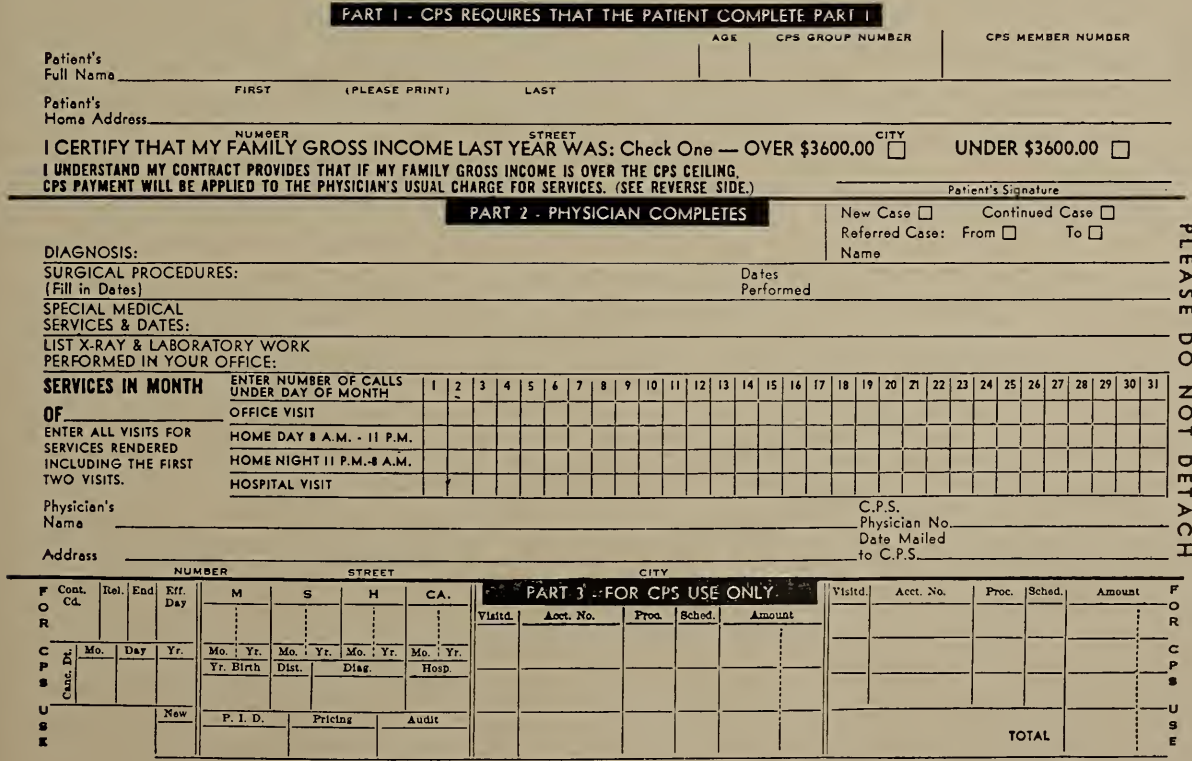
PART II: On *line one* give the diagnosis. At the end of the line indicate if the case is "new" or "continued" and if the patient is referred to or from another doctor. If a referred patient, give the other doctor's name.

On *line two* describe the surgical procedures performed, and give the dates.

On *line three* describe any special medical services rendered, other than those covered by fee for routine office, home or hospital visit. Give dates.

On *line four* list x-ray and laboratory work performed in your office.

Next indicate the month during which services were rendered. Bill C.P.S. once a month for all services rendered that month. Use a separate billing form for each C.P.S. patient, even if members of the same family. If services were rendered in more than one month, use a separate billing form for the services in each month.



PART 1 - CPS REQUIRES THAT THE PATIENT COMPLETE PART 1

Patient's Full Name _____ (FIRST) (PLEASE PRINT) (LAST) AGE | CPS GROUP NUMBER | CPS MEMBER NUMBER

Patient's Home Address _____ (NUMBER) (STREET) (CITY)

I CERTIFY THAT MY FAMILY GROSS INCOME LAST YEAR WAS: Check One — OVER $3600.00 ☐ UNDER $3600.00 ☐

I UNDERSTAND MY CONTRACT PROVIDES THAT IF MY FAMILY GROSS INCOME IS OVER THE CPS CEILING, CPS PAYMENT WILL BE APPLIED TO THE PHYSICIAN'S USUAL CHARGE FOR SERVICES. (SEE REVERSE SIDE.)

Patient's Signature

PART 2 - PHYSICIAN COMPLETES

New Case ☐ Continued Case ☐
Referred Case: From ☐ To ☐
Name

DIAGNOSIS:

SURGICAL PROCEDURES: (Fill in Dates) Dates Performed

SPECIAL MEDICAL SERVICES & DATES:

LIST X-RAY & LABORATORY WORK PERFORMED IN YOUR OFFICE:

SERVICES IN MONTH OF _____

ENTER ALL VISITS FOR SERVICES RENDERED INCLUDING THE FIRST TWO VISITS.

ENTER NUMBER OF CALLS UNDER DAY OF MONTH

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
OFFICE VISIT																															
HOME DAY 8 A.M. - 11 P.M.																															
HOME NIGHT 11 P.M.-8 A.M.																															
HOSPITAL VISIT																															

Physician's Name _____ C.P.S. Physician No. _____

Address _____ (NUMBER) (STREET) (CITY) Date Mailed to C.P.S. _____

PLEASE DO NOT DETACH

ATTENTION PHYSICIAN'S OFFICE: Please do not detach this stub. Detach the pink copy and one carbon. Send CPS the balance of the forms with carbon inserts intact.

FOR CPS USE

Cont. Cd.	Rel.	End	Eff. Day	M	S	H	CA.

Canc. Dt.	Mo.	Day	Yr.	Mo.	Yr.	Mo.	Yr.	Mo.	Yr.	Mo.	Yr.
				Yr. Birth		Dist.		Diag.		Hosp.	

New

P. I. D. | Pricing | Audit

PART 3 - FOR CPS USE ONLY.

Visitd.	Acct. No.	Proc.	Sched.	Amount

Visitd.	Acct. No.	Proc.	Sched.	Amount
			TOTAL	

FOR CPS USE

Next indicate, in the space provided, all office, hospital, home (day) and home (night) visits during the month. If more than one visit occurred on a certain day, the number of visits should be shown in the column for that day. List *all* visits, including the first two.

The last two lines are for the physician's name, his C.P.S. physician number, his office address, and the date the billing form is mailed to C.P.S.

PART III: This is for C.P.S. use only and requires no action by physicians, their secretaries, or patients.

Each billing form is in quadruplicate. The top *three* copies must be returned to C.P.S. intact (including carbon paper sheets and the right-hand binding). Doctors' offices retain only the pink copy, as indicated on the right-hand binding. Bills must be received by C.P.S. within six months of the month of service to be payable.

If the above step-by-step procedures are followed, clerical work in doctors' offices will be simplified and processing of bills by C.P.S. will be expedited. Moreover, patients will understand any direct charges which doctors may have arranged to make when the income is over $3,600.

NEWS and NOTES

NATIONAL • STATE • COUNTY

ALAMEDA

Officers of the **Pacific Dermatologic Association** for 1951, elected at the recent annual meeting in Oakland, are: President, Dr. Joseph Shaw of Seattle; vice-president, Dr. Hiram Newton of San Diego; secretary-treasurer, Dr. Ervin Epstein of Oakland. The meeting was attended by 125 members.

FRESNO

The first annual session of the **Fresno Medical and Surgical Institute,** arranged through the California Medical Association Committee on Postgraduate Activities, will be held Thursday and Friday, November 2 and 3, 1950, at the Hotel Californian, Fresno. The Institute is sponsored by the Fresno County Medical Society and the teaching staff will be furnished by the School of Medicine and Medical Extension, University of California at Los Angeles, through arrangement with Dr. S. J. Weinberg, Head of Postgraduate Instruction, Medical Extension.

Inquiries and communications regarding the Institute may be addressed to Glenn W. Gillette, 920 Helm Building, Fresno.

Thursday, November 2, 1950

8:00-9:00 a.m.—Registration: Mezzanine Floor, Hotel Californian. (Registration fee $5.00 entitles registrant to attend any or all of the other Postgraduate Institutes in this series 1950-51.)

Morning Session

Chairman: Dr. C. S. Mitchell

9:00-10:00 a.m.—"Diagnosis and Treatment of Virus and Rickettsial Diseases," Dr. Edwin Lennette, Chief of Virus and Rickettsial Laboratories, State Department of Public Health, Berkeley.

10:00-10:30 a.m.—Discussion period.

10:30-11:30 a.m.—"Viral and Rickettsial Diseases," Charles M. Carpenter, M.D., Professor of Infectious Diseases, School of Medicine, University of California, Los Angeles.

11:30-12:00 Noon—Discussion period.

12:00-1:45 p.m.—Luncheon and Round Table: Room 212, Californian Hotel. Chairman, Dr. R. A. Donald.

Afternoon Session

Chairman: Dr. T. A. Collins

2:00-3:00 p.m.—"Placentia Previa—Diagnosis and Treatment, with Special Reference to Placentography," Daniel G. Morton, M.D., Professor of Obstetrics and Gynecology, School of Medicine, University of California at Los Angeles.

3:00-3:30 p.m.—Discussion period.

3:30-4:30 p.m.—"Use of Scintillation Counter in Thyroid Uptakes," Raymond L. Libby, Ph.D., Associate Clinical Professor of Radiology, School of Medicine, University of California at Los Angeles.

4:30-5:00 p.m.—Discussion period.

Friday, November 3, 1950

Sessions at the Fresno County Hospital, 4461 Ventura, between Barton and 12th Streets.

9:00-9:30 a.m.—Surgical Case Presentation.

Chairman: Dr. C. A. Cabell

9:30-10:30 a.m.—"Chest Surgery, Including Surgical Treatment of Mitral Stenosis." William H. Muller, Jr., M.D., Assistant Professor of Surgery, School of Medicine, University of California at Los Angeles.

10:30-11:00 a.m.—Medical Case Presentations.

Chairman: Dr. Jos. Bolkovatz

11:00-12 Noon—"The Hemorrhagic Diseases," William N. Valentine, M.D., Assistant Professor of Medicine, School of Medicine, University of California at Los Angeles.

12:15-2:00 p.m.—Luncheon and Round Table: Room 212, Hotel Californian. Chairman, Dr. George Olson. Subject: "Set-up for Atomic Defense Medical Program."

2:00-3:00 p.m.—Chairman: Dr. F. R. Freeto. "The Use of ACTH and Cortisone in Malignant Disease," William S. Adams, M.D., Assistant Professor of Medicine, School of Medicine, University of California at Los Angeles.

3:00-3:30 p.m.—Questions.

3:30-4:30 p.m.—"Respiratory Tract Infections in Children," John M. Adams, M.D., Professor and Chairman of Pediatrics Department, University of California at Los Angeles, School of Medicine.

LOS ANGELES

Dr. Russell Starr of Los Angeles was elected president of the **Western Association of Railroad Surgeons** at the annual convention of that organization in Reno last month. Dr. Douglas L. Gannette of Los Angeles was elected first vice-president, Dr. Harry O. Hurd of San Rafael, treasurer, and Dr. W. W. Cummins of San Francisco, secretary.

* * *

The **Twentieth Annual Postgraduate Symposium of the Los Angeles Heart Association** will be held in the Wilshire-Ebell Theater, Wednesday and Thursday, October 18 and 19. The program follows:

Wednesday Morning, October 18, 1950

9:00—Registration.

9:25—Opening remarks. Lewis T. Bullock, M.D., president, Los Angeles Heart Association.

9:30—Electrokymographic Studies in Valvular Heart Disease and Ventricular Hypertrophy, Edward Phillips, M.D.

9:40—Anticoagulants in Congestive Heart Failure. David C. Levinson, M.D., and George Griffith, M.D., U.S.C. School of Medicine Division of Cardiology, Los Angeles County Hospital.

9:50—Problems Relating to the Employment of Individuals with Heart Disease, Eugene Levine, M.D.

10:00—Indications for and the Results of Resection of Aortic Coarctation, John Jones, M.D.

10:15—Recess.

10:30—What the Los Angeles Heart Association Means to the Doctor, Mr. Jack Spear, executive secretary, Los Angeles Heart Association.

10:45—Blood Volume Studies in Shock Following Myocardial Infarction, Clarence M. Agress, M.D., Marvin Rosenburg, M.D., Abraham Schneiderman, M.D., and E. J. Brotman, M.D., Department of Medicine, Wadsworth General Hospital, Sawtelle.

11:00—Basic Hemodynamic Principles in the Interpretation of Cardiac Disorders, Carl J. Wiggers, M.D., professor of physiology, Western Reserve University.

Wednesday Afternoon

2:00—The Present Status of the Problem of Essential Hypertension, George W. Pickering, M.D., professor of medicine, St. Mary's Hospital, London.

2:45—The Experimental Production and the Mechanism of Auricular Tachycardia and Premature Auricular Systoles in the Human, Eliot Corday, M.D., Alfred Goldman, M.D., Robert Oblath, M.D., Eleanor Gerlach, and Myron Prinzmetal, M.D., Institute for Medical Research, Cedars of Lebanon Hospital.

3:00—The Action of Procaine Amide in Cardiac Arrhythmias, M. H. Nathanson, M.D., and Harold Miller, M.D., U.S.C. Department of Medicine, Division of Cardiology; Department of Medicine, Cedars of Lebanon Hospital.

3:15—Recess.

3:30—Serum Electrolytes and the Electrocardiogram, Telfer Reynolds, M.D., U.S.C. School of Medicine and Los Angeles County Hospital.

3:45—Electrocardiographic Diagnosis of Myocardial Infarction in the Presence of Bundle Branch Block, Morley J. Kert, M.D., Department of Medicine, Wadsworth General Hospital, Sawtelle.

3:55—Resection of the Auricular Appendage, John M. Beal, M.D., William P. Longmire, Jr., M.D., and William H. Leake, M.D., Department of Surgery, Wadsworth General Hospital, Sawtelle.

6:00—Cocktails.

7:15—Dinner Meeting, the California Club, 538 South Flower Street. Guest Speaker: George W. Pickering, M.D.

Thursday Morning, October 19, 1950

9:00—Indications, Limitations and Contraindications of Cardiac Catheterization, Sidney S. Sobin, M.D., Cardiovascular Research Department, Children's Hospital, Los Angeles.

9:15—Factors Affecting the Circulation Time, Morton Lee Pearce, M.D., and Alvin Lewis, M.D., Departments of Medicine and Pathology, U.C.L.A. School of Medicine.

9:25—Pharmacology of Mercurial Diuretics, Adrian Goodman, M.D., U.S.C. Department of Medicine, Division of Cardiology, Los Angeles County Hospital.

9:35—The Toxicity of Mercurial Compounds—Pathological Studies, Edward M. Butt, M.D., chief pathologist, Los Angeles County Hospital.

9:45—Low Serum Sodium Levels in Cardiac Decompensation, Robert F. Maronde, M.D., U.S.C. School of Medicine.

9:55—Results in the Treatment of Rheumatic Fever with ACTH, George Griffith, M.D., Jack A. Sheinkopf, M.D., and Robert Morrison, M.D., U.S.C. Department of Medicine, Division of Cardiology, Los Angeles County Hospital.

10:15—Recess.

10:30—Classic Descriptions of Angina Pectoris and Coronary Disease, William D. Evans, M.D., Department of Medicine, College of Medical Evangelists.

10:45—The Measurement of Regional Circulation, Hardin B. Jones, Ph.D., Division of Medical Physics, University of California, Berkeley.

11:15—Vascular Spasm, George W. Pickering, M.D., professor of medicine, St. Mary's Hospital, London.

Thursday Afternoon

2:00—The Physiological Basis of Myocardial Failure, Carl J. Wiggers, M.D., professor and director, Department of Physiology, Western Reserve University.

3:00—Recess.

3:15—Blood Lipid Transport and Human Atherosclerosis, John W. Gofman, M.D., Ph.D., associate professor of medical physics, University of California, Berkeley.

4:45—Clinical Pathological Conference, George W. Pickering, M.D., Carl J. Wiggers, M.D., Hugh Edmondson, M.D., and L. J. Tragerman, M.D.

SAN FRANCISCO

Dr. Francis L. Chamberlain has been elected president of the newly organized San Francisco Heart Association, Inc. Other officers are Dr. Lowell A. Rantz, vice-president, Dr. Norman E. Freeman, secretary, John F. Forbes, treasurer, and Dr. Robert L. Smith, chairman of the board of governors.

* * *

Advance registrations are already being received by the San Francisco Heart Association for the twenty-first **Annual Postgraduate Symposium on Heart Disease** to be presented at the St. Francis Hotel October 25, 26, 27, 28. Guest speakers will be George W. Pickering, M.D., professor of medicine, University of London, and Carl J. Wiggers, M.D., professor of physiology, School of Medicine, Western Reserve University, Cleveland.

In addition to the two guest speakers, 43 local physicians will participate in the four-day program.

The courses in electrocardiography which proved so popular last year are being presented again this year. Physicians in military service, residents, interns and students will be admitted without registration fee to the scientific sessions.

The symposium program committee consisted of Dr. Maurice Sokolow, chairman, Dr. Robert H. Alway, Dr. Clayton D. Mote, and Dr. David A. Rytand.

TWENTY-FIRST ANNUAL POSTGRADUATE SYMPOSIUM ON HEART DISEASE

October 25, 26, 27, 28, 1950

Colonial Ballroom, St. Francis Hotel

Wednesday Morning, October 25, 1950

9:15 a.m.-12:15 a.m.

COURSES IN ELECTROCARDIOGRAPHY

ELEMENTARY

Presiding: Francis Rochex, M.D.

9:15-10:15—Fundamentals of Unipolar Electrocardiography, Winston Benner, M.D.

10:15-11:15—Ventricular Hypertrophy and Bundle-Branch Block, Herbert C. Moffitt, Jr., M.D.

11:15-12:15—Myocardial Infarction, Robert L. Smith, Jr., M.D.

ADVANCED

Presiding: William W. Newman, M.D.

9:15-10:15—Newer Concepts of Unipolar Electrocardiography, John J. Sampson, M.D.

10:15-11:15—The Value of Additional Exploratory Leads in Electrocardiographic Diagnosis, Maurice Sokolow, M.D.

11:15-12:15—Errors in the Diagnosis of Myocardial Infarction, Francis L. Chamberlain, M.D.

Wednesday Afternoon, October 25, 1950

1:15 p.m.-4:50 p.m.

Colonial Ballroom, St. Francis Hotel

SESSION ON HEART DISEASE IN CHILDHOOD

Sponsored by the American Academy of Pediatrics, Northern California

Presiding: Robert S. Leet, M.D.

President, Northern California Pediatric Society

1:15-1:40—The Significance of Cyanosis, Arthur Selzer, M.D.

1:40-2:05—The Management of Congestive Failure in Infancy and Childhood, Saul J. Robinson, M.D.

2:05-2:30—Cardiac Catheterization—Indications and Limitations, Herbert N. Hultgren, M.D.

2:30-2:55—The Role of Contrast Substances in the Diagnosis of Congenital Heart Disease, Earl R. Miller, M.D.

2:55-3:20—The Present Status of Surgery in Congenital Cardiovascular Disease, H. Brodie Stephens, M.D.

3:20-3:35—Recess.

3:35-4:00—A Pediatric Approach to the Child with Heart Disease, John A. Anderson, M.D.

4:00-4:25—Recent Advances in the Management of Rheumatic Fever, Harold H. Rosenblum, M.D.

4:25-4:50—Arrhythmias in Childhood, Robert H. Alway, M.D.

Wednesday Evening, October 25, 1950

8:00 p.m.

Colonial Ballroom, St. Francis Hotel

Presiding: Stacey Mettier, M.D.

Basic Hemodynamic Principles in the Interpretation of Circulatory Disorders, Carl J. Wiggers, M.D.

(This session and the Thursday evening session are held in collaboration with the Medical Extension (University Extension), University of California Medical School, as one feature of a postgraduate series of 12 evening lectures in general medicine.)

Thursday Morning, October 26, 1950

9:15 a.m.-12:05 p.m.

Colonial Ballroom, St. Francis Hotel

CLINICAL CARDIAC CONFERENCE

Presiding: Clayton D. Mote, M.D.

9:15-11:00—Presentation of selected cases of cardiovascular problems with discussion of diagnosis and treatment.

Participants: William L. Bender, M.D., Gordon E. Hein, M.D., J. K. Lewis, M.D., George W. Pickering, M.D., Hobart Rogers, M.D., Carl J. Wiggers, M.D.

11:00-11:15—Recess.

11:15-12:05—Physiological Basis of Myocardial Failure, Carl J. Wiggers, M.D.

Thursday Afternoon, October 26, 1950

2:00 p.m.-4:30 p.m.

Presiding: J. K. Lewis, M.D.

2:00-3:00—Hypertensive Cerebral Attacks, George Pickering, M.D.

3:00-3:20—Management of Cerebral Vascular Accident, Henry Newman, M.D.

3:20-3:40—Clinical Use of Derivatives of Veratrum and Ergot in the Treatment of Hypertension, Clarence M. Tinsley, M.D.

3:40-3:50—Recess.

3:50-4:10—Special Problems in the Management of Subacute Bacterial Endocarditis, Lowell A. Rantz, M.D.

4:10-4:30—Problems in the Management of Edema with Salt Restriction, John Luetscher, M.D.

Thursday Evening, October 26, 1950

8:00 p.m.

Colonial Ballroom, St. Francis Hotel

Presiding: William J. Kerr, M.D.

Headache—George Pickering, M.D.

Friday Morning, October 27, 1950

9:30 a.m.-12:00 m.

Presiding: Dwight L. Wilbur, M.D.

9:30-9:50—Lipoprotein in the Pathogenesis of Atherosclerosis, John Gofman, M.D.

9:50-10:20—Natural History and Management of Coronary Disease, A. L. Bloomfield, M.D.

10:20-10:35—Controversial Aspects of the Treatment of Myocardial Infarction: Bed Rest and Anticoagulants, David A. Rytand, M.D.

10:35-10:50—Controversial Aspects of the Treatment of Myocardial Infarction: Management of Shock and Cardiac Failure, George B. Robson, M.D.

10:50-11:00—Recess.

11:00-12:00—Coronary Circulation During Hemorrhage and Shock, Carl J. Wiggers, M.D.

Friday Afternoon, October 27, 1950

2:00 p.m.-4:40 p.m.

Presiding: Charles A. Noble, Jr., M.D.

2:00-3:00—The Present Status of the Problem of Essential Hypertension, George Pickering, M.D.

3:00-3:30—Surgical Treatment of Non-Congenital Heart Disease, Emile F. Holman, M.D.

3:30-3:50—Therapy of Cardiac Arrhythmias During and After Surgical Operations, William J. Kerr, M.D.

3:50-4:00—Recess.

4:00-4:20—The Cardiac Patient as a Surgical Risk, Francis L. Chamberlain, M.D.

4:20-4:40—Sympathectomy in the Treatment of Peripheral Vascular Disease, Norman E. Freeman, M.D.

Friday Evening, October 27, 1950

Colonial Ballroom, St. Francis Hotel

7:30 p.m.

Annual Dinner Meeting

Presiding: Ann Purdy, M.D., Chairman

Adventures in Hypertension—George Pickering, M.D.

Saturday Morning, October 28, 1950

9:00 a.m.

San Francisco Hospital, Ward P

Presiding: J. Marion Read, M.D.

Presentation of Patients with Various Types of Heart Disease.

Participants: LeRoy Briggs, M.D.. Maurice Eliaser, M.D.. J. K. Lewis, M.D., Clayton D. Mote, M.D., Charles A. Noble. Jr., M.D., Arthur Selzer, M.D., Norman Sweet, M.D., Charles F. Sweigert, M.D., Clarence M. Tinsley, M.D.. Dwight L. Wilbur. M.D.

SANTA BARBARA

The first annual session of the **Santa Barbara Medical and Surgical Institute** will be held Thursday and Friday, October 12 and 13, 1950, in Bissell Auditorium of Cottage Hospital, Santa Barbara. One of a series sponsored by the California Medical Association Committee on Postgraduate Activities. the program was arranged by the Santa Barbara County Medical Society, Postgraduate Study Committee and the Committee on Graduate and Postgraduate Medical Education of the College of Medical Evangelists.

Thursday, October 12, 1950

8:30-9:30 a.m.—Registration: Bissell Auditorium, Cottage Hospital. Registration fee of $5 entitles registrant to attend any or all of the other Postgraduate Institutes in the 1950-1951 series.

Morning Session

Chairman: H. I. Burtness, M.D., Santa Barbara

9:30-10:30—"Clinical-Pathological Conference," directed by Carrol S. Small, M.D.

10:30-11:15—"Borderline Psychiatric Problem Cases," George T. Harding, M.D.

11:15-11:30—Intermission.

11:30-12:00—"Postgraduate Activities of the California Medical Association," John C. Ruddock, M.D.

12:00-2:00—Luncheon: Discussion groups with Institute speakers.

Afternoon Session

Chairman: V. G. Middleton, M.D., San Luis Obispo

2:00-2:30—"Surgical Conditions in Infancy and Childhood," J. Norton Nichols, M.D.

2:30-3:00—"Differential Diagnosis of Jaundice," John E. Peterson, M.D.

3:00-3:15—Intermission.

3:15-4:00—"Differential Diagnosis of Intracranial Tumor and Vascular Disease," Cyril B. Courville, M.D.

4:00-4:30—"Management of Obstetrical Complications," Ralph J. Thompson, M.D.

4:30-5:00—Discussion.

7:00-9:00—Dinner: "Medicolegal Pitfalls in Medical Practice," Louis J. Regan, M.D., LL.B.

Friday, October 13, 1950

Morning Session

Chairman: W. C. Huff, M.D., Oxnard

9:00-9:30—"Use of Radioactive Iodine in Diagnosis and Treatment of Thyroid Disease," Mortimer E. Morton, M.D., Ph.D.

9:30-10:15—"Use and Abuse of Antibiotic Therapy," Albert G. Bower, M.D.

10:15-11:00—"Office Urology," Roger W. Barnes, M.D.

11:15-12:00—"Hyperventilation—Physiological and Clinical Significance," James J. Short, M.D.

12:00-2:00—Luncheon: Discussion groups with Institute speakers.

Afternoon Session

Chairman: J. W. Moore, M.D., Ventura

2:00-2:45—"Iatrogenesis in the Field of Cardiac Diseases," William Paul Thompson, M.D.

2:45-3:15—"Value of Anorectal Examination in General Practice," Malcolm R. Hill, M.D.

3:15-3:30—Intermission.

3:30-4:15—"ACTH and Cortisone — Physiological and Therapeutic Considerations," E. Kost Shelton, M.D.

4:15—Discussion.

GENERAL

More than 75 per cent of the **medical graduates who interned in Army hospitals** under the Military Intern Training Program have remained in the Army longer than the legal requirement for active duty, according to figures released recently by Major General R. W. Bliss, the Army Surgeon-General.

Of the 311 young physicians who passed through the program, 235 elected to remain on active duty in the army medical service, either as regular or reserve officers. Of the other 76, several have requested return to active duty after a comparatively brief period of nonmilitary practice. All but seven of the 76 retained their reserve commission.

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

OCTOBER 1950

University of California at Los Angeles

Recent Advances in Obstetrics and Gynecology—One week—October 16-20.

NOVEMBER - DECEMBER 1950

University of California at Los Angeles

"Ophthalmological Aspects of the Medical Specialties." November 7 to December 12, 1950.

Note: The above class comprising six evening lectures and demonstrations will meet on Tuesday evenings, 7:30 to 9:30, at Long Beach Veteran Hospital.

DECEMBER 1950

University of California at Los Angeles

Internal Medicine—9 months full-time, December 4, 1950 to September 1951.

JANUARY 1951

University of California at Los Angeles

Advanced Hematology. January 10 to February 28. One per week.

BOOK REVIEWS

THE MERCK MANUAL OF DIAGNOSIS AND THERAPY. Eighth Edition, Merck and Co., Rahway, N. J., 1950. $4.50 Regular Edition and $5.00 Thumb-Index Edition.

According to the foreword, "this is a completely new handbook, not a revision of previous editions. More than 100 outstanding clinicians throughout the United States have served as authors or consultants and assisted the Editorial Board of 12 physicians." The book consists of two parts, the first of 1,460 pages being an expansion of the material in the previous edition and the addition of new material on diseases, major symptoms, and treatment, and part two, of 110 pages, presenting new chapters on routine immunization measures, clinical and bedside procedures, office laboratory tests, items for the doctor's bag, pre- and postoperative care, etc. Of special interest are chapters on medical emergencies, such as drowning, burns, poisoning, venomous bites, electrick shock and infusion reactions.

Each of the 20 section of Part I is ended with a comprehensive list of classified prescriptions for the treatment of symptoms and pathological physiology of the diseases discussed in the section. Each section is divided into chapters. Each chapter, in general, contains a general introductory statement about the nature of the disease; this is followed by discussions of symptoms and signs, pathology, diagnosis and treatment. There is much new material on allergies, blood cell dyscrasias, uterine bleeding, therapy of thyrotoxicosis, tetanus and malaria, indications for cortisone and ACTH, BAL, mustard gas and newer antibiotics. Surgical as well as medical diseases are discussed. The section on poisoning consists of 45 pages of briefly presented but very helpful information.

There is an up-to-date table of recommended chemotherapy in the more common infections and a table on differential diagnosis of headache.

In view of the scope of the book, with discussions of most of the medical and surgical diseases compressed to 1,570 pages, it is to be expected that many subjects are treated in a far too sketchy and unsatisfactory manner. Especially disappointing to the reviewer were sections on ulcerative colitis, pruritus ani, renal function, alcoholism and herpes, which lacked much of the newer developments.

Merck's Manual is a handy, quick reference book, useful for orientation but not for a complete discussion of any subject.

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INFANT NUTRITION—ITS PHYSIOLOGICAL BASIS. By F. W. Clements, M.D., D.P.H., D.T.M., Senior Medical Officer, Commonwealth Department of Health, Australia. The Williams and Wilkins Company, Baltimore, 1949. $4.50.

This is an excellent reference book for the obstetrician, pediatrician, and general practitioner. The subject of fetal nutrition is reviewed comprehensively. Recent studies in the field of biochemistry and physiology are summarized and applied to the clinical management of pregnancy. As might be expected in a book by an Australian, breast feeding and breast milk are discussed at great length. In that country the common lack of home refrigeration, the infrequency of pasteurization and of tuberculin testing of dairy herds, and finally the limited availability of evaporated milk all contributed to the advocacy of breast feeding during the last decade. As a result the study of the biochemistry of breast milk has been pursued more intensively in Australia than in this country. A detailed and well documented comparison of cow's milk and breast milk is made.

There follows a section on caloric and nutrient requirements of infants and children including metabolic disturbances of dietetic origin.

The contents of this book are not quite duplicated by any one American text. Perhaps a more descriptive title for it would be, "Recent advances in the study of fetal and infant nutrition with the clinical application thereof."

* * *

MEDICINE FOR NURSES. By W. Gordon Sears, M.D. (Lond.), Senior Physician and Superintendent Mile End Hospital, London. The Williams and Wilkins Company, Baltimore, 1949. $3.00.

Since World War II most nursing schools have put greater emphasis on academic instruction than they did during the war years. Consequently textbooks are being selected not for brevity or with an eye to fulfilling minimum requirements, but for an increasingly comprehensive knowledge of basic nursing courses. Recent textbooks in medicine for nurses are larger than before, include more information about diseases, emphasize in detail the nursing aspects of diseases, and are well illustrated, some with color plates. In comparison with these newer textbooks the present volume, published in England, is inadequate. The field of medicine is too briefly covered, and many of the details of diseases with which the present graduate nurse is expected to be familiar are omitted. The medical aspects of coronary thrombosis, for example, are covered in less than one page. The term *myocardial infarction* is not mentioned and no reference is made to shock or changes of blood pressure which may occur. The pathogenesis and pathology of the condition are summed up in four sentences. Under treatment, the student nurse is told that the patient should remain in bed at least eight weeks. The use of anticoagulants is dealt with in one sentence: "Dicoumarol may be used to prevent extension of the clotting."

In most of the sections the details of nursing care are not demarcated clearly from the over-all medical treatment. This has advantages in some respects since the student is made aware of the whole therapy in a given problem—nursing as well as medical. On the other hand, a careful distinction between the duties and responsibilities of nurse and physician is not emphasized in many cases. The student might justifiably be confused as to what she is expected to do and what is the doctor's responsibility.

Terms used throughout the book are British and in some cases might cause confusion. A rubber sheet, for example, is referred to as a macintosh; phenobarbital is called phenobarbitone; chills are rigors, etc. The double-joined vowel is used throughout the text: oedema, aenemia, haemorrhage, aetiology.

There are 67 illustrations. The photographs for the most part are clear and typical of certain medical conditions. Diagrams are used to explain some of the fundamental physiologic factors involved in diseases. Although very simple, these diagrams are pertinent and basically correct in terms of classical principles. There are no colored illustrations.

This book cannot be recommended as a standard textbook in medicine for the majority of nursing schools. As a supplementary volume to be used primarily for review, or as a reference for abbreviated courses in nursing, such as those given to nurses' aides or military corpsmen, it might prove useful.

RADIOGRAPHIC ATLAS OF SKELETAL DEVELOPMENT OF THE HAND AND WRIST. Based on the Brush Foundation Study of Human Growth and Development initiated by T. Wingate Todd, M.B., Ch.B., F.R.C.S. By William Walter Greulich, M.A., Ph.D., Professor of Anatomy, Stanford University School of Medicine; S. Idell Pyle, M.S., Research Associate Brush Foundation and Department of Anatomy, Western Reserve University School of Medicine, Stanford University Press, Stanford, California, 1950. $10.00.

The publication of this atlas marks an important step toward integrating concepts of growth and development into the practice of clinical medicine. From the work of child development centers throughout the country, it has become established that the process of skeletal development is the most significant available measure of physical maturation. It is closely related to reproductive and total somatic growth and is of great clinical value, especially when considered in relation to chronological age.

With the publication by T. Wingate Todd, in 1937, of his "Atlas of Skeletal Development," clinically useful assessments of skeletal age became feasible on the basis of one standardized radiograph of the hand and wrist. Refinements of Todd's method, embodied in the present Greulich and Pyle atlas, improve the reliability of such assessments and make it possible to evaluate not only the level of development but also its uniformity. Trained observation also allows deductions about the adequacy of mineralization and about scars of interrupted growth suggesting past illness. If hand films are repeated after a suitable interval, they provide a means of determining the rate as well as the level of maturation.

The excellence of the volume lies in the clarity of its directions and in the choice of standards, many of which are taken from a successive series on the same children. There is thus very little difficulty in matching an unknown x-ray to its correct age peer.

Although the assignment of correct skeletal age to a given film requires practice and patience, still it is a method which is well within the capacity of any x-ray specialist or endocrinologist. It is to be hoped that the practice of making an accurate reading of a single hand film on the basis of these precise standards for boys and girls will replace the older, more expensive and less rewarding method of assigning skeletal age by comparing films of a large number of joints to sets of standards which are only approximate. Since the value of such readings has already become established in the study of childhood endocrine and growth problems, it is probable that the method will come into general practical use.

* * *

PROGRESS IN CLINICAL ENDOCRINOLOGY. Edited by Samuel Soskin, M.D., Director, Medical Research Institute, Michael Reese Hospital, Chicago, Illinois; Dean, Michael Reese Hospital Post-Graduate School; Professorial Lecturer in Physiology, University of Chicago. Grune and Stratton, New York, 1950. $10.00.

The 79 papers included in this volume represent an attempt to present the subject concisely. The editor makes no claim that the work represents a complete review or textbook; some of the writings deal broadly with the subject matter, while others cover only very limited aspects. The book is written primarily for the clinician, but historical and physiological material necessary for adequate understanding is not slighted. The list of contributors is impressive; most of them are well-known authorities in their field.

In most cases, controversial matters are clearly indicated, although from the text one might assume that the evidence in favor of the "free diet" in adult diabetics is incontrovertible. Pure speculation (e.g., the possible insect transmission of endemic goiter) is, fortunately, held to a minimum.

The several papers dealing with the treatment of hyperthyroidism, utilizing antithyroid drugs, radioactive iodine, and surgery; and those concerning the diagnosis and treatment of adrenal diseases, in themselves makes the volume valuable.

The techniques and interpretation of steroid hormone assays, tools which are becoming increasingly available to the clinician, are discussed in a general manner.

The beneficial effects of testosterone in situations where protein anabolism is desired, the use of ACTH and cortisone in arthritis, and the role of hormones in the treatment of other "non-endocrine" diseases are handled adequately. Transuterine and transabdominal pneumoperitoneum in the diagnosis of pelvic disease will be of interest to the gynecologist. Gynecomastia, anorexia nervosa, cryptorchidism, infertility and antihormones are among the subjects discussed in the light of recent discovery.

In general the papers are well written. Prolixity and duplication are minimal. The book is recommended for the clinician who is not intimately acquainted with the recent literature and yet has more than a superficial interest in endocrine problems.

* * *

YOU AND YOUR HEART—A Clinic for Laymen on the Heart and Circulation. By H. M. Marvin, M.D., T. Duckett Jones, M.D., Irvine H. Page, M.D., Irving S. Wright, M.D., and David S. Rutstein, M.D. Random House, New York, 1950. $3.00.

"You and Your Heart" is an authoritative, factual, and fascinating account of the workings and misworkings of the heart and circulatory system. It is a book designed for the layman—for anyone curious about the mechanisms of that "toughest" of all muscles, the heart, for anyone suffering from heart disease or with a family history of heart "trouble," for anyone who fears the possibility of "a stroke," "heart failure," "high blood pressure," or "hardening of the arteries"; in short, for anyone with a heart.

"You and Your Heart" was written by five of the leading experts in the cardiovascular field who collaborated to answer the questions of the average person about the heart, to explain the reasons for the prescriptions and proscriptions of the doctor, to explode some of the misconceptions about heart disease held by even the most intelligent of laymen, and to remove needless fear. A professional nonmedical writer "translated" the information into simple, vivid language that is easily understood.

This book covers a wide field. It describes the functioning of the normal heart and circulation from birth through life. It explains the most important of the diseases of the heart and blood vessels, tells how they develop and what can be done about them. It is not a book on self-treatment, but instead gives information, as Dr. Irving S. Wright puts it, "to supplement the physician's advice and, where needed, to strengthen his hand." In its factual, unexcited way, it helps to remove anxiety about heart diseases, to reassure the fearful patient and his family, and to show the person with a heart disease how he may continue to lead a productive life.

In addition—and this will be of interest to physicians as well as to the general public—"You and Your Heart" stresses the need for intelligent use, by the profession and patient alike, of the public health services, for a partnership between the physician and layman in the campaign against diseases of the heart and circulation, and, above all, for more work and more research on the cardiovascular diseases.

The book can be highly recommended.

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The Common Cold—Fact and Fancy

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SUMMARY

A great deal of folklore, superstition and emotional reaction is attached to the common cold, but established objective information is quite limited. The evidence concerning etiology, epidemiology, physiology, prevention and treatment of the common cold is briefly summarized and critically evaluated. There is disappointing lack of real progress in any of these aspects of the common cold problem.

THE common cold is probably the commonest human ailment. It is responsible for twice as many of the infant illnesses as any other cause.[8] At least 15 per cent of all time lost by industrial workers has been attributed to colds and although the economic implications have probably been overstated, the total amount of discomfort and reduction of working efficiency caused by this "minor" illness must be enormous.[15]

Most people have a cold two or three times every year. It is usually a mild disease, killing no one, and nowadays the incidence of severe complications is low. However, everyone who has a cold exhibits poignant resentment of the illness, not infrequently transferring this feeling to the person from whom he might have "caught it," and who is consequently made responsible. When afflicted with a cold everyone feels that "medical science ought to do something about it"; he tends to believe that "there must be some good remedy," and easily falls prey to the gaudy advertisements of "sure cures" that fill the scientific journals, magazines, newspapers and comic strips. Almost every new variety of drug to reach the market is given a trial against colds, to be praised at first but soon discarded. And the common cold with its misery and its nuisance continues as before.

Not only is the popular interest in this malady considerable but each individual feels he "knows all about it" and is eager to transmit his knowledge to other sufferers. As a result there are about as many versions of the etiologic delineation, pathogenesis and treatment of the common cold as there are people who have the illness. Scientifically trained physicians tend to laugh at this "vox populi" and discredit its significance. However, it might be well to keep in mind that folklore is made up essentially of observations over centuries and conclusions drawn from them. Erroneous though the *interpretations* may be, repeated and consistent observations on the natural history of the common cold are likely to have some validity. In order to be fully acceptable, the experimental results should agree with, and explain, the observations made every day by physicians and lay people alike.

What is a common cold? From the specific names given to it in various languages (headcold, Schnupfen, rhume de cerveau, etc.) one might expect a well defined clinical entity. Inquiry into the minor upper respiratory infections suffered by different people soon reveals, however, that concepts of what constitutes a common cold vary widely from person to person. For one a "headcold" is mainly coryza with little systemic involvement, for another a feeling of "stuffiness in the head" with prostration, while a third visualizes sore throat, laryngitis and tracheitis. For the purpose of this discussion the "common cold" will be considered to include the entire spectrum of acute minor upper respiratory affections from minimal rhinitis to tracheobronchitis, excluding pneumonitis and influenza. Common symptoms include malaise, headache, roughness or soreness of throat, and nasal discharge

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which is serous at first, purulent later. The symptoms may be fleeting or may last more than a week.

What causes a cold? For centuries it has been well accepted that draughts, sudden changes in temperature, wet feet, dietary indiscretions, emotional upsets, etc., may precipitate an attack of the common cold. More frequently, however, a cold is thought to be "caught" from another person.

Several virus infections with fairly well defined clinical manifestations may give rise to a mild illness indistinguishable from the common cold.[1] This is certainly true of the influenza viruses and probably of the virus responsible for primary atypical pneumonia. However, it seems fairly certain on epidemiological grounds that these viruses are not responsible for a sizable fraction of the common colds ordinarily encountered.

The possibility that the common cold may be a distinct infectious entity has been tested experimentally many times since the original transmission studies of Kruse in 1914.[1, 9, 11, 20, 21, 24, 27, 31] It has usually been found that bacteria-free nasal washings from patients in the early stages of a cold when instilled or sprayed into the noses of healthy human volunteers are capable of inducing colds in 50 to 90 per cent of cases. Such transmissions can be carried out in series from person to person, with washings taken prior to the onset of symptoms. They leave no doubt that a transmissible agent is often present in the common cold and that it can induce the typical symptom complex.

The nature of this agent or agents has not been completely established, but in many ways it has the characteristics of a virus. (Bacteria have been excluded as an important initial etiologic factor.) While a number of investigators have claimed propagation of "cold" viruses in tissue culture or in fertile hens' eggs[12, 19, 24, 26, 31] the evidence to date is not conclusive. However, a good deal has been learned about the behavior of such infectious agents: Their stability on storage at low temperatures[2, 26] their approximate size (20-50 millimicrons),[2] their presence in the nasal secretion at various times, and the duration of the immunity of human volunteers to reinfection after an experimentally induced disease.[2, 9, 25] The failure to adapt any of the agents to ordinary laboratory animals has greatly impeded progress in this direction.

Other support for the "catching," transmissible nature of at least some colds comes from experiences in isolated communities. In Spitzbergen, for example, colds almost vanish from the communities during the winter months of isolation. With the coming of the first ship, an epidemic of colds breaks out, involving most of the population.[23] There are many examples of isolated parties of Arctic explorers who remain free from colds during the rigors of their solitary travels, only to contract colds as soon as they return to civilization.[2] Similarly it is a common experience that people return fit and well from a summer holiday—and promptly come down with a cold as they rejoin their working group.

Thus there seems little doubt that infectious agents, probably of virus nature, are involved at least in some colds. However, the epidemiological features of infectious disease of this type are very complex. They raise the questions of latency of the "cold" agents; of a carrier stage; of the multiplicity of types—or strains—of "cold" viruses and the cross-immunity between such viruses; of the magnitude of an infectious dose; of the relative ease of transmitting infection by sneezes, handkerchiefs, or hands, versus floating airborne particles, and many others. The very complexity of the situation and the inconstant epidemiological pattern strongly suggest that the infectious agent is only a part of the etiologic delineation of the common cold. The other part must be supplied by some host factor, termed "resistance."

This resistance might be a function of vascular responsiveness, of specific immunity, of many nonspecific and unknown factors that keep a person well, such as nutrition, hydration, rest, constitution,[30] etc. It is often assumed that environmental factors (chilling, heating, moisture, dryness, irritants, draughts, etc.) cause colds by lowering the systemic or local resistance. This might permit a latent virus to become active, or might result in more fertile ground for a newly introduced agent.

Can nonspecific environmental factors, or alterations of host response alone, cause colds without the presence of an infectious agent? There can be no question that peripheral chilling results in reflex vasoconstriction in the nasal mucous membranes, or that direct irritation of the mucosa produces disturbances of vascular tone and of mucous film.[18, 28] It is equally established that an allergic reaction, or sometimes a strong emotional upset results in a pattern of response in the upper respiratory tract indistinguishable clinically from the common cold. This consideration forces the conclusion that no certain etiological diagnosis could be made from the clinical picture of an early common cold.

The upper respiratory tract, particularly its mucous membrane, is capable of only a very limited number of responses. These responses may be set in motion by a variety of stimuli. Following the early response of mucous membranes and blood vessels (vasoconstriction, ischemia, vasodilatation, epithelial injury, increased capillary permeability, serous exudation, etc.) the subsequent course (particularly epithelial necrosis, secondary bacterial invasion) may be identical no matter what the original cause of the disturbance. Consequently one must accept the possibility that the environmental factors previously mentioned may produce the picture of a sporadic cold occasionally in the absence of an infectious agent. The limited experimental evidence[2] obtained under controlled conditions has not supported (to date) the theory that chilling, wet feet, or draughts, may cause colds. The importance of reaction of allergic type is well recognized in the terms "perennial" rhinitis, "allergic" rhinitis, etc. These manifestations are indistinguishable from the common cold in all respects except for their greater

frequency of occurrence (more than three or four times a year). Similarly, exaggerated vascular reactions are recognized in "vasomotor" rhinitis.

The recognition of the great similarity of these reactions to the usual common cold inevitably leads to a consideration of the role of histamine in the latter condition. Objective measurements[32] revealed wide variations in the concentration of a histamine-like substance in nasal secretions in cases of common cold and allergic rhinitis alike.

Gordon[16] demonstrated that dilute solutions of histamine phosphate sprayed into the nasal mucosa resulted in sneezing, blanching, edema and increased nasal secretions followed 30 minutes later by pronounced redness of the mucosa. The entire reaction subsided within one hour.

These findings merely emphasize the uniformity of organ response to a variety of stimuli, but do not prove that all "cold"-like responses are necessarily on an allergic or vasomotor basis. A great deal more information is needed before any clear-cut relationship between the common cold and histamine-like substances can be postulated. The widespread use of antihistaminics has contributed little to the understanding of the role of histamine in colds.

Can one prevent a cold? Many infectious diseases induce permanent immunity with a single attack. Others can be prevented by avoiding exposure or by suitable immunization of susceptible persons. None of these features appears to be true of the common cold. Withdrawal into relative isolation may well prevent colds, but return to group-life usually results in a new wave of colds. It is well established that the many "bacterial vaccines" are of no prophylactic value[14] and to date no adequate information on "virus vaccines" is available.

On the assumption that histamine is somehow involved as an etiologic factor in the common cold, antihistaminic drugs have been widely advertised and used on a large scale for prophylactic purposes. In spite of the large volume of antihistaminic drugs sold for this purpose, only a single controlled study has been published.[3] In this study thonzylamine hydrochloride (Neohetramine®) was administered in doses of 50 to 150 mg. daily to 300 persons for a period of six months, while 300 others received a placebo. All persons had "equal chances of exposure to the common cold by intermingling freely."[3] Among the controls only 20 per cent remained free from any colds during the observation period, while among the persons receiving antihistaminic drug, 80 per cent remained well. The results of this prophylactic experiment are statistically significant, but there is great need for verification. Allergists treating many patients with antihistaminic drugs for various disorders over long periods report that in such persons colds develop "with the same frequency and of the same duration as without the drugs."[10] If it is remembered that most persons have only two or three colds per year, serious question arises as to the advisability of taking day in and day out an antihistaminic drug, the chronic side-actions of which are still largely unknown, and which certainly could at best give only partial protection. For persons who have three, four or more colds a year, where the presumptive diagnosis of "vasomotor rhinitis" or "allergic rhinitis" may be justified, the continued administration of antihistaminic agents might be more seriously considered.

Can one effectively treat the "common cold"? The status of therapy for the common cold up to 1946 has been adequately reviewed by Reimann:[29] Bed rest, forced fluids (alcoholic or otherwise) and salicylates tend to make the patient more comfortable, although there is doubt whether these measures in any way influence the severity or duration of the illness. Chemotherapy is indicated for bacterial complications, but not for the basic disorder.

Claims for the effectiveness of antihistaminic drugs in "stopping," "curing" or "killing" the common cold have flooded every physician's mailbox. The approval by the Food and Drug Administration of three such drugs for over-the-counter sale has greatly stimulated the advertising pressure of an industry whose sales are estimated to top $100,000,000 this year.[13] A critical review and evaluation of the published claims for antihistaminic drug therapy in the common cold has been published by the Council on Pharmacy and Chemistry of the American Medical Association.[10] Of several published studies the work of only two groups of investigators could be included; the others employed no controls whatever. The studies of Brewster[5, 6] and of Arminio and Sweet[3] were analyzed in detail. Brewster's earliest studies were quite inadequately controlled. In his later work the statistics were weighted by the inclusion of a high proportion of "cures" in persons manifesting symptoms for less than six hours. Such symptoms have a great tendency to regress spontaneously. Brewster's most significant figures are probably those shown in Table 1.[6]

Even though the difference is statistically significant one cannot but wonder at the results of a study in which 53 per cent of the control group had results the same as those attributed to drug action in

Table 1

Duration of symptoms	Treated Group: Number of Patients	Helped: Cured	Helped: Improved	Not Helped	Control Group (Given Placebos): Number of Patients	Helped: Cured	Helped: Improved	Not Helped
12 hours or less	694	322	201	171	140	39	35	66
		46%	29%	25%		28%	25%	47%
		75%				53%		

the treated group. The study of Arminio and Sweet[3] also presented statistically significant data on the shortening of illness by the use of an antihistaminic drug. However, a number of features in their report cast doubt on the validity of their entire study, as has been discussed elsewhere.[10]

A critical appraisal of the results of any experimental work dealing with the common cold is fraught with great difficulties for a number of obvious reasons: (1) There is no universally accepted, clear-cut definition of the disease. (2) There is no clear-cut acceptable relationship between subjective symptoms and objective findings.[22] (3) No clinical or laboratory criteria are available to prove the diagnosis unequivocally in all cases. (4) The variability of the clinical syndrome is great. (5) The etiologic delineation of the common cold is not established. (6) It is quite possible that the common cold syndrome may follow a multitude of etiologic factors.

For these reasons it is doubtful whether the criteria for a completely objective study, as outlined by the council,[10] can ever be fulfilled. It seems more likely that an appraisal of the value of antihistaminic drugs will eventually be arrived at by the study of large, controlled groups of patients by a number of investigators in different places, basing conclusions principally on symptomatic relief obtained by drug or placebo. One such study (on a small scale, however) using Neo-Antergan® was carried out at the student health service of the University of California Medical Center between September 1948 and April 1949, with the results shown in Table 2.

Another much larger controlled study carried out on an industrial population in California gave similar results.[4]

These three controlled studies (excluding that of Arminio and Sweet[3] because of doubtful interpretation) all show a difference of approximately 15 to 20 per cent between control and drug-treated groups, in favor of the drug (Table 3). If it be assumed that from 10 to 30 per cent of all so-called "colds" may have a strong allergic or "vasomotor" component in which antihistaminic drugs would be expected to be beneficial, it must be concluded that antihistaminic agents do not cure the majority of cases of the common cold.

A very recent well-controlled study at the United States Military Academy[17] showed no essential difference in results between the treated and control groups. Treatment was not generally begun until some hours after onset of symptoms. This tended to exclude patients with transient symptoms — the group on which the proportion of spontaneous cures is likely to be highest.

Table 2

Medication	Number of Patients	Relief	No Relief	Undesirable Side Action
Drug	45	19	26	22
		42%	58%	49%
Placebo	47	12	35	14
		26%	74%	30%

Table 3

Investigators	Control Group: No. of Patients	Control Group: Per Cent Failure	Treated Group: No. of Patients	Treated Group: Per Cent Failure
Brewster[6]	140	47	694	25
Beard[4]	94	44	140	29
Talbot and Jawetz	47	74	45	58

After a thorough study of all available data on the therapy of the common cold one is inclined to remember an account of therapy used more than 50 years ago:[7] "We were rubbed lavishly with hot grease" . . . "stinging plaster made of mustard and white flour" was applied . . . "We used to sit for half an hour before bed-time with our feet in a pail of hot mustard water. Then we were put to bed surrounded by hot soapstones, and in the morning we were damp but cured." It seems doubtful whether modern science has much more to offer in the treatment of the common cold.

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Intestinal Obstruction

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SUMMARY

Despite improvements in knowledge of the pathologic physiology of intestinal obstruction, the introduction of gastrointestinal decompression, and more effective antibiotics, obstruction remains a serious disease with a high mortality rate. Although the diagnosis is often obscure, it can usually be made with a fair degree of accuracy by the history alone; pain is fairly constant and characteristically is of a cramping type simulated by very few other lesions. Distention is present in low lesions but absent in high lesions; on the contrary, vomiting is minimal in low lesions but prominent in high lesions. Visible peristaltic waves are almost pathognomonic of intestinal obstruction. Increased peristaltic sounds, as noted by auscultation, are extremely helpful in diagnosis; they are absent in paralytic ileus.

Although intestinal obstruction is a surgical lesion, it must be remembered that in the type produced by adhesions the obstruction can be relieved by gastrointestinal decompression in 80 to 90 per cent of cases. Operation is usually indicated a short time after relief because of the probability of recurrence. In practically all other types of obstruction decompression is indicated only while the patient is being prepared for operation. Obviously any type of strangulation demands early operation. Strangulation can usually be diagnosed, particularly if it develops while the patient is under observation. Increase in pain, muscle spasm and pulse rate are important indications of development of strangulation.

Dehydration and electrolytic imbalance are produced almost universally in high obstruction. Usually, it is unwise to wait until these two deficiencies are corrected before operation is undertaken, but correction must be well under way at the time of operation. Resections should be avoided in the presence of intestinal obstruction, but obviously will be necessary in strangulation. Operative technique must be expert and carried out with minimal trauma. Postoperative care is very important; important features are decompression, for two to three days, accurate fluid and electrolytic replacement, and transfusions.

THE medical profession has always realized that intestinal obstruction is a serious disease carrying with it a high mortality rate. Fortunately, the mortality rate has decreased sharply during the past several years. Much of this improvement in results has been related to intelligent use of intestinal decompression. It must be emphasized, however, that unless decompression is utilized intelligently, the mortality rate may actually be increased. Although there are two types of obstruction, namely mechanical and functional, the material in this presentation will be confined largely to the former type. Surgeons, of course, realize the frequency of functional obstruction (for example, paralytic ileus) because it is so common after celiotomy. It is likewise encountered in abdominal trauma and notoriously develops after retroperitoneal injury.

The incidence of the various types of obstruction varies considerably in different reports, depending largely upon the percentage of patients derived from an emergency service; for example, in a city hospital where the percentage of emergency cases is high, the incidence of strangulated hernia will be high, whereas in private hospitals, where a relatively small number of emergency cases are received and where the number of patients admitted for operation is high, the incidence of obstruction due to adhesions will be high. A summary of numerous reports in the literature is given in Table 1.

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DIAGNOSIS

If the patient is questioned carefully regarding certain points in the history, the diagnosis of intestinal obstruction can usually be made within a few

TABLE 1.—*Incidence of Types of Obstruction* (summarized from the literature).

	Per Cent
Strangulated external hernia	33
Obstruction due to adhesions (¾ are postoperative)	32
Obstruction due to neoplasm	15
Intussusception	8
Volvulus	3
Internal hernia	2
Foreign body (gallstones, etc.)	1
Miscellaneous causes (congenital anomaly, mesentery thrombosis, etc.)	6

minutes. The most important diagnostic aid lies in the type of pain. With few exceptions, the pain of intestinal obstruction starts out as a true cramp which is mimicked by few other diseases. In other words, the cramp develops for a minute or two and gradually disappears, remaining absent for a variable length of time, perhaps one to five minutes. Commonly a moderate amount of mild diffuse pain remains between cramps. This is particularly true if the obstruction has been present for a considerable time, and when strangulation is present.

Examination of the abdomen is usually very helpful, as an intestinal pattern and peristaltic waves will almost always be demonstrable unless the abdominal wall is very obese. If the distention is severe, the abdominal wall may be tense, but muscle spasm is absent unless strangulation is present. Vital information can be obtained by auscultation of the abdomen. Almost always there will be increased sounds unless peritonitis is present. However, since the intestinal sounds are not constant but manifested only during peristaltic waves, it is usually necessary to listen for three to four minutes before an accurate assay can be made as to the amount of accentuation.

On numerous occasions, particularly in the postoperative care of patients, it will be extremely difficult to differentiate between postoperative ileus and mechanical obstruction. However, in the former complication pain is minimal and peristaltic sounds either absent or minimal; likewise peristaltic waves are not seen in postoperative ileus. Differential diagnosis may be extremely difficult if the mechanical obstruction is complete, in which case distention would be minimal and pain variable. X-ray examination is of extreme aid in diagnosing intestinal obstruction. However, with few exceptions the examination must be limited to a plain film of the abdomen or to films with barium enema; ordinarily, barium by mouth is strongly contraindicated unless it is known that the obstruction is in the pylorus or duodenum and the barium can be aspirated immediately after the examination is completed. A variable amount of fluid is found in the free peritoneal cavity. In the absence of strangulation it is clear and relatively scanty. It has a high protein content similar to that of blood plasma.

Symptoms of shock may develop late in intestinal obstruction. They are related to the loss of fluid which may be as great as 5 to 6 per cent of the body weight. Occasionally the shock is related to the development of strangulation of a large loop of intestine; in this instance a large amount of blood along with fluid would be trapped within a very short time, thereby reducing the blood volume rather abruptly. When perforation through a gangrenous area takes place, shock is likewise common. In these circumstances it is due largely to the absorption of toxic products escaping into the free peritoneal cavity.

High Intestinal Obstruction. Although pain is the first symptom of intestinal obstruction, nausea and vomiting develop early if the obstruction is high, that is, above the ileocecal valve. When the obstruction is located in the duodenum, distention may be minimal because only the stomach is involved. However, on rare occasions when chronic obstruction of the duodenum is present the stomach becomes so dilated as to completely fill the abdomen when filled with gas and fluid. When the obstruction is located lower in the small intestine, a variable amount of distention will develop, depending largely upon the amount of vomiting. Constipation is of course a symptom of intestinal obstruction, but when it is located high it should be emphasized that the patient may have one or two bowel movements several hours after the development of obstruction because the portion of the intestinal tract distal to the obstruction can be emptied as usual.

Dehydration and hypochloremia develop in high intestinal obstruction at a rate depending largely upon the amount of vomiting. Dehydration naturally results in diminished blood volume and decrease in urinary output, which in turn results in elevation of the non-protein nitrogen level. The diminished blood volume is accentuated by the loss of plasma through the lumen and wall of the intestine.

Figure 1.—Plain film of abdomen reveals distended loop of intestine with a "herringbone" pattern typical for small intestine. The patient, aged 30, had a cesarean section 12 days previously and had abdominal pain with nausea and vomiting for two days prior to admission. Decompression was effective; the tube was removed in 24 hours and feedings begun. Obstruction recurred and operation was performed. An adhesion at the suture line was found obstructing a loop of mid-ileum. Decompression longer than 24 hours might have resulted in relief lasting at least for several days, thus allowing restoration of the physical condition to normal. Operation could then have been performed in an interval phase when the operative risk was optimum.

X-ray studies are of great value in the diagnosis of high intestinal obstruction. When the obstruction is proximal to the ileocecal valve loops of the small bowel will be distended but there will be no distention of the large bowel. Distention of the small bowel is associated with a rather typical herringbone pattern on the x-ray film (see Figure 1). Fluid levels are likewise usually observed.

Low Intestinal Obstruction. In low intestinal obstruction the pathologic changes differ from those in high intestinal obstruction, largely because vomiting is minimal or even absent. It is not uncommon for a patient to have low obstruction for a period as long as four to five days and with a history of having vomited only once or twice during that period. However, the dehydration still develops with a variable amount of hypochloremia due largely to lack of intake of water and food. Distention itself is an extremely dangerous complication of obstruction. It may actually cause gangrene although gangrene is usually caused by compression of vessels by a hernial ring or other mechanical process. When compression is applied to the wall of the intestine, whether it is produced by an extrinsic mass or gaseous distention, the veins will be obstructed before the arteries, primarily because they are more collapsible and usually located in a more superficial position. Obstruction of the veins permits the accumulation of fluid in the wall of the intestine and in the lumen because of transudation. Sperling has shown in experimental studies that gangrene can be produced if a pressure of 20 cm. of water is maintained in the lumen of the intestine for a period of 24 hours. Most patients with low intestinal obstruction appear quite ill, and notoriously tolerate operation poorly. This debilitation is no doubt related in some way to the extreme distention, but the exact mechanism is unknown, unless the anoxia in the bowel wall produced by the distention gives rise to toxic products in the wall of the intestine itself.

Constipation will of course be a prominent feature in low intestinal obstruction; rarely will there be a bowel movement after complete obstruction develops. Occasionally bloody discharge in the rectum may be noted and it may be expelled. However, this is so uncommon as to be of little value diagnostically except in infancy when conditions such as intussusception are associated with bloody discharge. As in high intestinal obstruction, a plain x-ray film will be very helpful in diagnosis. If the obstruction is limited to the left side of the colon, considerable large bowel distention may be observed (see Figure 2). Obstruction is quite infrequent in carcinoma of the right colon, but is common in carcinoma of the transverse colon. When there is considerable doubt in the diagnosis, a barium enema is permissible to establish diagnosis, although the barium should be removed by a rectal tube and the bowel irrigated after the x-ray examination. If barium is forced under pressure past an obstruc-

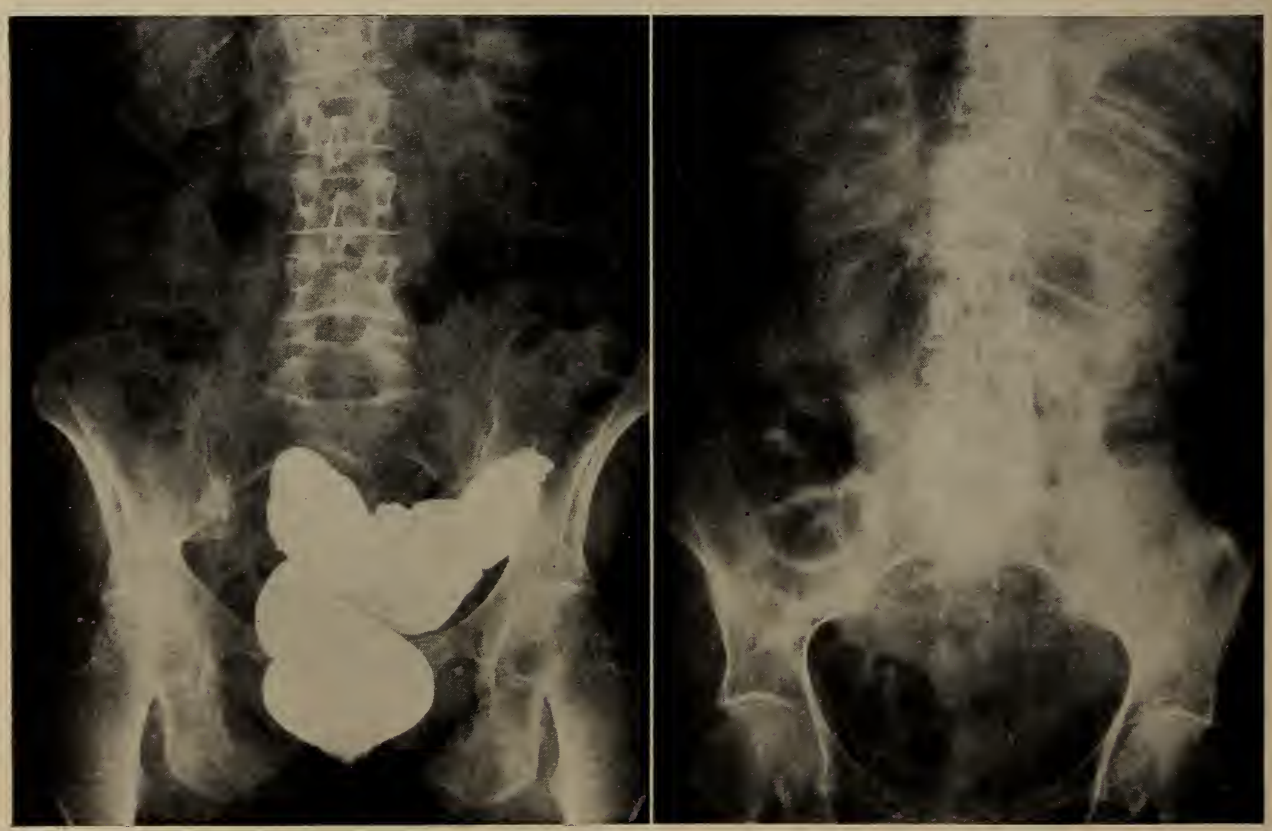

Figure 2.—*Left:* Plain film of the abdomen in a patient, aged 58, with evidence of complete intestinal obstruction for three days but with a history of having vomited only once. Distention was pronounced. Note the distended loop with haustral markings typical for large bowel. *Right:* Same patient. Barium enema revealed an obstruction in the sigmoid colon. A diagnosis of carcinoma was obvious.

tion, it may be retained for a considerable time and greatly complicate surgical treatment (see Figure 3).

DIAGNOSIS OF STRANGULATION

Although it is usually quite difficult to diagnose strangulation in patients who are admitted in emergencies, it can usually be detected when it develops in patients who have been under observation for several hours. It is so important to determine the presence of strangulation as soon after development as possible that the manifestations are listed below in some detail.

1. An *increase in the amount of pain* is one of the most valuable indications of the development of strangulation. This is particularly true when the pain is superimposed on the abdominal cramps. Notoriously the pain of strangulation is much more severe than that of simple obstruction; it may be so severe that the patient pleads for narcosis.

2. An *increase in abdominal tenderness* invariably develops along with the increase in pain. It is usually but not invariably located at the site of pain.

3. An *increase in pulse rate* is almost always found when strangulation develops. It is due in part to the development of pain but is accentuated by the loss of blood through the strangulated loop.

Figure 3.—The patient had a history of cramping pain and alternate attacks of constipation and diarrhea. Distention was present at intervals. A diagnosis of partial obstruction of the large bowel, due probably to carcinoma, was made. A barium enema revealed a constricting lesion in the sigmoid colon; under moderate pressure the barium passed the obstruction and filled the rest of the large bowel. The film shown above was taken 48 hours after the barium enema and after evaluation along with a soapsuds enema. Note the pronounced retention of barium proximal to the obstruction. This complication will usually prevent consideration of resection with primary end-to-end anastomosis, because the desiccated masses of barium can usually not be washed out with enema or colonic irrigations.

4. The development of a *mass* strongly suggests the presence of a strangulated loop which becomes so distended as to appear firm to palpation. Obviously the mass will not be palpable if the strangulation involves merely a small area of intestine such as that produced by an adhesive band.

5. The development of *muscle spasm* in simple strangulation is somewhat variable but usually is present to a slight degree soon after the strangulation develops. The amount of intestine strangulated may exert a slight influence on the development of muscle spasm but by no means is the amount of spasm dependent upon the amount of intestine involved in the strangulation. A most important factor in the development of muscle spasm is perforation through the gangrenous wall.

6. *Leukocytosis* usually develops comparatively early in strangulation. The number of leukocytes per cubic millimeter may be no greater than 10,000 to 14,000 until peritonitis develops, when it may rise sharply to 25,000 or 30,000.

7. A *sudden fall in blood pressure* is sometimes indicative of the development of strangulation in a long loop of intestine which may have been obstructed for several hours preceding the strangulation. It may also indicate perforation, since it is encountered in other lesions such as hemorrhage. Fall in blood pressure alone is not diagnostic of strangulation. It is, nevertheless, a sign of serious complication, and usually indicates that surgical treatment is urgently needed. Fever is usually present in strangulation although it may also be produced by dehydration. However, the temperature is rarely very much elevated unless peritonitis is present.

The physician must not wait for all of the manifestations listed before diagnosing strangulation. As a matter of fact, when fever or leukocytosis develops, peritonitis is commonly already present, and the patient is liable to die regardless of the type of therapy instituted. Perhaps the earliest signs of strangulation are increase in pain and increase in pulse rate. When these two symptoms develop, the possibility of strangulation must be considered. If there is any doubt about the possibility of strangulation while the patient is undergoing conservative treatment, it is usually advisable to resort to celiotomy rather than to wait until the manifestations are obvious (see Table 2).

Table 2.—*Contraindication for Continuation of Nasal Suction in Intestinal Obstruction.*

1. Increase in abdominal pain.
2. Increase in abdominal tenderness.
3. Increase in pulse rate.
4. Development of a mass.
5. Development of muscle spasm.
6. Failure to obtain relief of distention.
7. Leukocytosis.
8. Fever.
9. Sudden fall in blood pressure.

TREATMENT

Decompression. The treatment of intestinal obstruction is dependent upon the type of obstruction. With the utilization of the principle of decompression advocated by Wangensteen, almost all types of obstruction now can be much more intelligently treated. As a matter of fact, obstruction due to adhesions can be completely relieved in 80 to 90 per cent of cases, but only if decompression is utilized intelligently. Decompression is likewise very effective in functional ileus; operation is obviously contraindicated in obstruction of this type.

Accordingly, decompression can be utilized as a definitive method of treatment in functional ileus and obstruction due to adhesions. However, it is very seldom effective in such lesions as carcinoma of the colon, volvulus, intussusception, extrinsic mass, and stricture. It is obvious that some of the latter named lesions, including intussusception and volvulus, must be treated by emergency operation as soon as the patient's condition can be brought to that of reasonable operative risk. However, in obstruction of that type, where immediate operation is mandatory, decompression should be instituted as soon as the patient is admitted to the hospital so that the stomach and upper jejunum may be evacuated, thereby facilitating anesthesia as well as reduction of distention. Moreover, early decompression will prevent further development of distention by removing all swallowed air.

Therefore, it is always good therapy to institute decompression immediately after admission to the hospital even though the exact type of obstruction is still unknown. Opinions differ as to the type of tube to be utilized in decompression. In general there are three types (see Figure 4). The Miller-Abbott tube, the Harris tube and the Cantor tube are actually superior to the Levine tube placed in the stomach because decompression can be achieved down to the point of obstruction. Unfortunately it is sometimes very difficult to pass the tube beyond the duodenum. It is true that the Harris tube, weighted with mercury at the tip, is usually passed more easily than the Miller-Abbott tube. An added advantage of the Harris tube is that it has a large lumen. This minimizes blocking of the tube with food particles—a serious complication which if not appreciated can defeat the value of decompression. Often it may be desirable to insert a large stomach tube to wash out all food particles from the stomach and then insert a smaller tube for decompression. Even so, it is essential that the decompression apparatus be inspected frequently during therapy to be sure that decompression is being carried out.

As previously indicated, decompression therapy can be considered as definitive treatment when the obstruction is due to adhesions. After good decompression is obtained, the obstruction may be relieved, although the tube must not be removed too early. In general it is rare to obtain significant relief of obstruction in less than two or three days. Accordingly, the tube must be kept in for at least that long even though it may appear obstruction has been relieved. After it is obvious that obstruction has been relieved, the tube can be removed and the patient permitted to take water by mouth. Liquids and soft diet can be given thereafter, but only in small, gradually increased amounts. Although decompression may relieve the obstruction, it is liable to recur when the patient resumes a normal diet. This recurrence is so common that it is usually advisable to operate for correction of obstruction during the interval of relief.

Operative Treatment. Careful judgment must be exercised in determining the time for operation in intestinal obstruction. As previously noted, in many cases in which the obstruction is produced by adhesions it will be relieved by decompression alone. However, on most occasions it will be necessary to operate after food intake has been resumed because obstruction is so liable to recur.

Except in paralytic ileus and obstruction due to adhesions, operation will be necessary as soon as the patient is in condition to withstand the procedure. Even though strangulation of the intestine is obvious, it is always necessary to correct such decrements as dehydration and loss of electrolytes. Although the usual rate of introduction of intravenous fluid is 500 cc. per hour, this rate may be increased greatly in the presence of dehydration, unless there is a history of cardiac disease. Accordingly it may require four to six hours to improve the patient's condition to the point where he will tolerate the operation with moderate safety.

There are no accurate rules regarding the amount of fluid and electrolyte to give the patient with obstruction, but certain general principles are agreed upon. For example, when dehydration is present, fluids are given rapidly and the urinary output measured every few hours. Until the urinary output is equivalent to at least 50 cc. per hour, it may be assumed that dehydration still exists. The solution usually used to overcome dehydration is 5 per cent glucose with normal saline solution. However, it must be emphasized that once the electrolyte deficiency has been corrected, administration of saline solution in the immediate postoperative period should be carried out cautiously, particularly in patients whose kidneys are perhaps damaged by arteriosclerosis or other disease. Coller's formula, which states that 0.5 gm. of sodium chloride per kilogram of body weight may be administered for each 100 mg. of chloride deficiency per 100 cc. of plasma, can be used, but with caution. Only in young individuals with normal kidneys can this formula be used with safety. It should be emphasized that in elderly people whose kidneys are functioning below normal, it is unsafe to give the amount of salt called for in the formula, particularly if operation is to be carried out immediately, lest salt retention cause oliguria or anuria postoperatively.

Many patients with intestinal obstruction will need a transfusion of blood before or during the operation. Determination of hemoglobin value, packed red cell volume and erythrocyte count at the

time of admission of the patient will yield misleading data; because of dehydration and reduced plasma volume, the values will be relatively high. Accordingly these determinations must be repeated in three to four hours after hydration is carried out, in order to obtain information on the real status of the blood. If, for example, results of blood studies on admission are normal findings, or if results of examination of the blood drawn three to four hours later (before complete hydration has taken place) are slightly below normal, it may be assumed that the patient actually is anemic and should be given blood before as well as during operation.

Certain principles in the operative treatment must be recognized and respected. Manipulation of the intestine must be held to a minimum. If strangulation is present, superficial exploration of the abdomen will almost invariably reveal its location. Obviously, if a condition such as intussusception is present, superficial palpation will reveal a mass, thereby making further exploration unnecessary. In the absence of a mass or obvious location of the obstruction, it may be necessary to examine various loops of intestine. If decompression has been quite effective, there may not be significant dilation of the intestine proximal to the obstruction. However, in ordinary circumstances the surgeon may be guided by observation of dilated loops proximal to the obstruction and collapsed loops distal to the obstruction. Frequently, indeed, observation of such conditions will lead the surgeon rapidly to the point of obstruction.

In general, if there is active obstruction, resection should be avoided if possible, but obvious gangre-

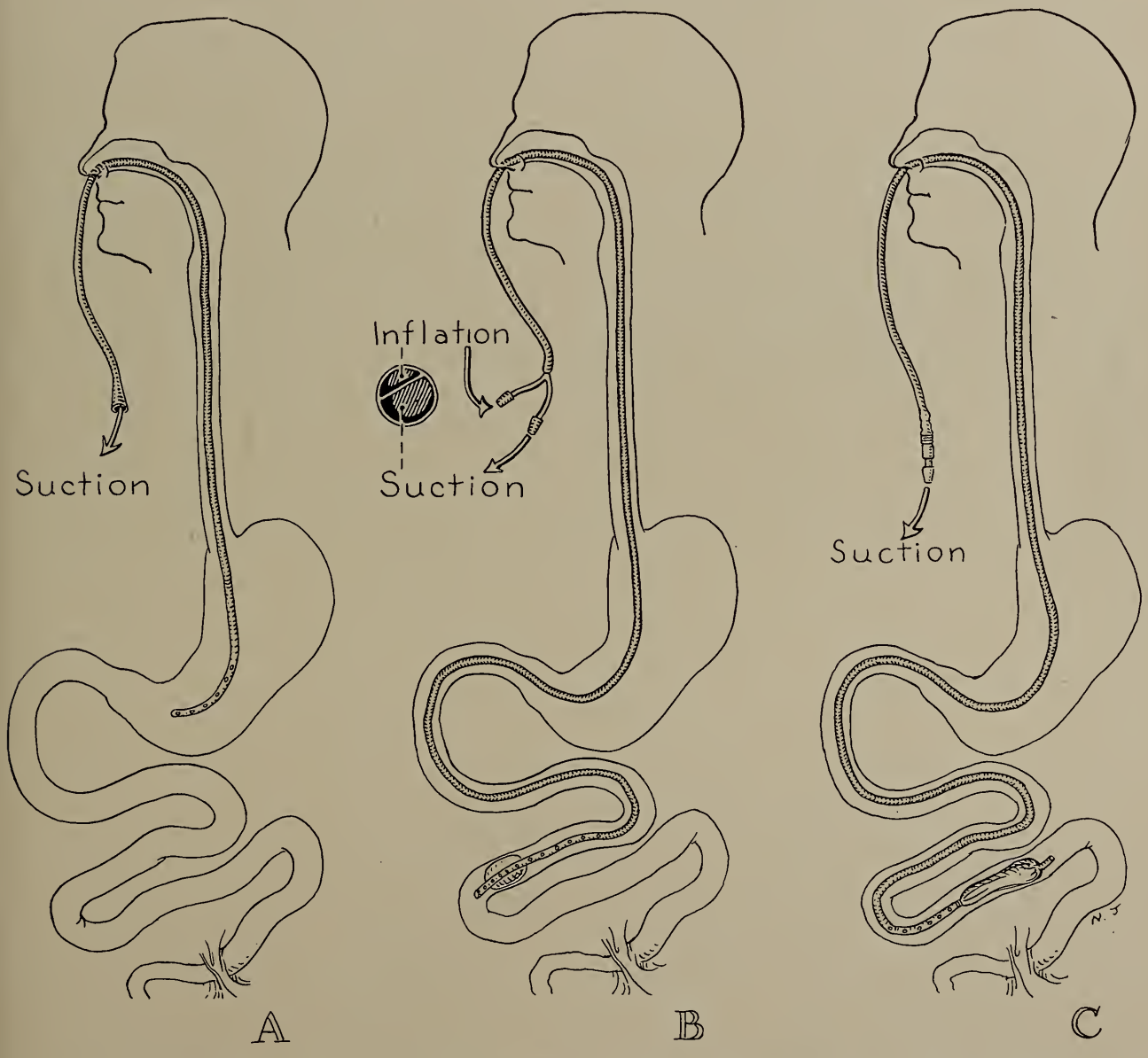

Figure 4.—Three types of tubes are available for gastrointestinal decompression: (a) Ordinary Levine tube inserted through the nose into the stomach. (b) The Miller-Abbott tube can be passed through the duodenum down to the point of obstruction. The tube contains two lumina as indicated by the insert. The balloon at the tip contains air. (c) The Harris tube can be passed down to the point of obstruction; it has an advantage over the Miller-Abbott tube because it has a large (only one) lumen for evacuation of fluid and food particles. The rubber balloon at the tip contains mercury (after Cole in Canadian Medical Association Journal).

nous loops of intestine or loops without viability cannot be returned to the peritoneal cavity. When resection is done, it will occasionally be life-saving to bring the strangulated loop outside the peritoneal cavity as an obstructive resection. The wound then may be closed around the two branches of the loop. This procedure is much more applicable to obstructed strangulated loops in the large bowel than to those in the small bowel because the postoperative loss of fluid and electrolyte from the small bowel is so much greater than from the large. (It should be noted in passing that resections can be carried out more boldly than in the past, provided adequate blood is given during and after operation.)

Another precaution which must be respected at all times is that anastomosis must not be carried out in an area where the intestine is edematous. In other words, the resection must be wide enough so that the anastomosis can be performed through relatively normal intestine.

POSTOPERATIVE TREATMENT

With very few exceptions, gastrointestinal decompression must be instituted after operation. If the Miller-Abbott tube or Levine tube was functioning before operation, it should be left in during and after operation. This will maintain decompression so that pressure of distention against a suture line will be prevented. How long to continue decompression after operation cannot be determined by a simple rule. However, with few exceptions, it must be maintained for 48 hours after resection and anastomosis have been carried out. After 48 hours, if a moderate amount of distention is present, perhaps because of inefficient decompression, it may be necessary to continue decompression for another day. Occasionally when the tube is removed and the patient is given fluids by mouth, distention reaccumulates. In such circumstances it may be necessary to replace the tube after 24 to 36 hours. Auscultation of the abdomen may help in determining when to remove a tube or to begin feedings: Once peristaltic sounds return to normal, food intake should ordinarily be tolerated satisfactorily unless obstruction exists.

As was intimated previously, the blood picture must be followed closely and transfusion carried out if the protein content or the erythrocyte count is below normal.

RESULTS

The mortality rate in intestinal obstruction before the institution of gastrointestinal decompression was as high as 35 per cent. It varied somewhat depending upon the number of strangulations in the respective series. At present the mortality rate is between 10 and 15 per cent for a large series of patients. This improvement is due largely to decompression, a more judicious use of blood, a better understanding of fluid and electrolyte balance, and the use of chemotherapeutic agents. Naturally, the duration of obstruction affects the mortality rate. For patients receiving care within 24 hours of the onset of symptoms, the mortality rate should be as low as 5 per cent.

Virology of Poliomyelitis

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SUMMARY

The virus of human poliomyelitis has been demonstrated in excretions before onset of the disease, during the disease, and in convalescence. It may be confused with different viruses likely to be found in the same sources in clinical conditions resembling poliomyelitis.

Immunologic differences between strains of poliomyelitis virus have been detected so that three types are now evident. The distribution of these types and their importance as causes of epidemics are not known. This multiplicity of immunologic types is an important factor in considering immunization of humans. Commercial manufacture of vaccines faces many technical problems.

Recently the Coxsackie virus has been demonstrated in humans with a disease closely resembling poliomyelitis.

THE infective agent of poliomyelitis has been defined in terms of its source, its pathogenicity for a limited host range, the pathologic and histologic features of the changes it causes in human and primate hosts, and its immunologic characteristics.[26] It has recently been given generic and specific names, *Legio debilitans*, in an effort to bring some order out of the chaos in the field of virus taxonomy.[5] This effort was probably not entirely justified by the stage of development of information on the subject. It is to be hoped, however, that this step will lead to the development of a more widely acceptable scheme of classification of the neurotropic viruses. This presentation will be largely confined to discussion of the virus of human poliomyelitis. Other viruses possibly of significance in human disease will be touched on briefly; the so-called Coxsackie virus will be discussed more especially.

Excretion of poliomyelitis virus during the course of infection and by carriers has been the subject of much important investigation in the past. The virus is demonstrable in the naso-oropharynx during four or five days prior to onset of symptoms and perhaps for as long as ten days after. It is also excreted in the feces for as long as four months after onset although less than 25 per cent of convalescent patients shed the virus past the sixth week.[28] The virus may be found in the feces some days prior to onset. The longest period so far observed was 19 days.[6] Where the virus is elaborated has not yet been determined. It has been demonstrated in the walls of the intestine and in mesenteric lymph nodes of experimental animals and of man.[3,4] It has also been found in tonsils.[17] The suggestion is strong that the wall of the alimentary tract is the primary site of invasion as well as the point of major excretion from the body. The virus has been demonstrated in peripheral nerves of experimental monkeys by electron micrography.[11] Children are more likely to excrete the virus than are adults, and the stools of young family contacts of patients are more liable to contain the virus than are the stools of adults of the family.[28] The virus was found in stools and throats of six out of ten patients with mild "summer grippe" occurring in an epidemic among children.[31] Recently, another virus, Coxsackie virus, has been isolated by inoculation of infant mice with pharyngeal and fecal excretions from patients who had symptoms closely resembling those of poliomyelitis.[9, 10] This agent has been detected in several sections of the country and like the poliomyelitis virus apparently has a wide geographic distribution.[8]

A number of other viruses have been described which resemble human poliomyelitis virus and which have been found under circumstances that allow of considerable doubt as to their etiologic connections with the human disease. Some confusion has been created in the past by the fact that some of these viruses have been regarded by certain workers as "models" of human poliomyelitis virus. The virus of mouse encephalomyelitis (Theiler virus), Columbia SK, MM, and encephalomyocarditis viruses can be listed in this group of infective agents.[26] They are probably primarily parasitic in lower animals, some occasionally attacking man, others probably never causing human disease.

Large scale investigation of the subject of differences that might exist among various strains of human poliomyelitis virus has for many years been hindered by the expense of experimental animals and the rather academic nature of the problem. Recently, however, greatly increased interest has been shown in the possibility of artificial immunization against the clinical disease, and as a consequence animals in plenty have become available for solution of a problem that may have retained its academic character but has acquired a very practical stature. Work on this problem during the past two or three years has brought to light that there

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are at least three major types or varieties of poliomyelitis which infect man.[1, 2, 3, 14, 16, 18, 23, 24, 30] Techniques include challenge of convalescent immune monkeys with large doses of viruses from different sources. By using two immunologically different viruses as prototypes, three types can be distinguished. Preliminary experiments with neutralization tests using serum from monkeys immunized with the prototypes have indicated that the same viruses fall in the same three types. Another technique in process of development has yet to be put to this use; this involves flocculation of purified viral antigens in specific immune sera, and the test is performed *in vitro*.[30] Yet to be determined (and of epidemiologic importance) is the geographic distribution of types over the world, the percentage occurrence of types in epidemics, and which types are to be found in carriers.

If vaccines capable of conferring adequate immunity are to be manufactured, distributed, and administered on a scale wide enough to curb the disease, several questions other than those regarding immunologic type differences must be answered. One is: Are killed or inactivated viruses immunogenic? Some work along this line[20, 22] indicates that formalinized virus preparations do provoke resistance to homologous test virus given intracerebrally. Another question is: How much overlapping immunity is produced by virus of one type as vaccine against another type? So far, indications are that little if any such cross-immunity is established, even with living vaccines,[1, 2, 3, 16, 18] although there is some suggestion that the death rate in animals paralyzed for a second time is lower than the rate in control groups (unpublished data). There is some evidence[25] that the immunity of infected animals is different from immunity of vaccinated animals and it has been suggested that this immunity to infection resides in the tissue of the central nervous system. This work has not yet been confirmed, however, so that the role of tissue antibody in resistance and even its existence are still in doubt.[32] Although considerable work has been done on the problem of attenuating or altering the virulence of a poliomyelitis virus to make it a safe vaccine in the manner of smallpox vaccine, yellow fever vaccine, and others, no such product is immediately forthcoming. Another problem in the manufacture of a vaccine is its source. Spinal cords of infected monkeys have thus far served for experimental vaccines, but obviously this supply is too limited. Promise for solution of this problem is offered by the development of a technique for culture of human poliomyelitis virus in infantile human tissues, not restricted to nervous tissue and including skin.[12] This may lead to *in vitro* methods suitable for large-scale commercial production. The use of some chemical or physical method for purification and concentration of the virus would be a great help to settle the problem of source of vaccine. A recent report demonstrated that poliomyelitis virus can be concentrated to some extent and somewhat freed of extraneous brain tissue material by processing with protamine sulfate.[35] The problem of demyelinating encephalomyelitis as a postvaccinal complication will necessitate use of methods to remove the encephalitogenic factor from vaccine made from central nervous system tissue. This problem is under active investigation in connection with rabies vaccine manufacture, and a recent report states that some success has been achieved in an experimental method for removing the troublesome fraction.[13]

Problems presented by this disease have been enhanced recently by the discovery of another viral agent (previously mentioned) which is present in secretions of the nose and throat and in feces[9, 10] of patients with paralytic or non-paralytic disease resembling poliomyelitis. This agent was found in feces of non-paralytic patients during an epidemic of poliomyelitis.[8] It was also found in the feces of some of the previously mentioned patients with "summer grippe"; and when monkeys were inoculated with preparations from the feces of those patients, typical poliomyelitis virus was recovered from the monkeys. So the two viruses may co-exist.[21a] Accidental laboratory infections with this virus have resulted in a disease with symptoms of pleurodynia. Neutralizing antibodies developing during convalescence are distinguishable from antipoliomyelitis antibodies. Five antigenic types of the virus have been defined on the basis of complement-fixation tests.[7, 15, 33] The influence of these findings on the future control of poliomyelitis cannot yet be assessed. Monkeys are not infected experimentally with this virus except for the cynomolgous monkey, in which a mild disease resembling experimental non-paralytic poliomyelitis develops.[21]

Thus, a more thorough understanding of the virology of poliomyelitis is necessary for an intelligent approach to the problems of the control of the disease. And at present data are being gathered in various cooperating and also independently operating laboratories in order that this goal may be achieved.

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Diagnostic Problems in Poliomyelitis and How They Are Met

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SUMMARY

A brief review of salient facts pertaining to poliomyelitis is presented as an introduction to the other articles which follow, each a part of a symposium concerning this clinical entity in its various phases.

POLIOMYELITIS is divided into three clinical groups, abortive, non-paralytic, and paralytic. As long as fever persists, the disease may progress from one of the less severe categories to the graver. It is probable that in non-epidemic periods many cases of a sporadic nature are diagnosed incorrectly. During epidemics, physicians are more alert to the probability of the occurrence of the disease, and increasing experience at such times sharpens diagnostic acumen.

At present there is no method by which abortive poliomyelitis may be accurately diagnosed. Diagnosis must rest purely upon epidemiological grounds, suspicion, and inference. As in healthy typhoid or diphtheria carriers who have never had symptoms of these diseases, infection with poliomyelitis virus may produce no evidence of disease in the host. Howe[4] stated that 100 cases of abortive poliomyelitis occur for each diagnosable case that is reported. Formerly, this incidence was believed to be much less; it is probably very much higher. In a careful study made during 1948 in Auckland, Thompson[6] found the over-all ratio of suspect illness to positive diagnosis to be 300:1. In a house-to-house canvass, he accepted as abortive cases those in which the start of illness fell within six days on either side of the onset of illness in a known poliomyelitic contact. He found the chief symptoms to be fever, headache, vomiting, diarrhea, and sore throat, in many instances accompanied by pain or stiffness in the neck, drowsiness, abdominal pain, and delirium. (In the author's experience, low lumbar backache has been noted more frequently; and it has also been observed that departure from normal bowel habit, either diarrhea or constipation, varies with different epidemics or may be absent. Delirium has not been observed.)

It has been believed that changes in the spinal fluid do not occur in abortive poliomyelitis cases. Such is not always the case, for occasionally the author has noted both increased protein content and cell counts in the spinal fluid of patients who had no detectable signs of muscle weakness or reflex changes. On the whole, however, it is best to consider those cases abortive in which no clinical evidence of central nervous system involvement is present, the picture being that of a mild, short, nonspecific illness. However, that infection is present has been shown by the presence of the virus in the stools[2] of some of these patients at a time when rises in titer in the antiviral properties of the blood also developed.

Patients with non-paralytic poliomyelitis have transitory signs of paresis or mild paralysis from which they rapidly recover. The onset of the disease is like that of the paralytic form, the degree of severity varying from patient to patient. As in the paralytic cases, the course of the disease may be either monophasic (four-fifths of the cases) or biphasic (one-fifth of the cases).

While the biphasic type may occur at any age, it is commonest in the age group five to nine years inclusive. It is rare in very young children. Outside the age bracket of greatest incidence, most of the remainder of such cases occur in adults. In those cases in which the course of the disease is biphasic, diagnosis cannot be made until evidence of central nervous system involvement develops. In the majority of cases, however, the onset of poliomyelitis is without any distinct phase, and either is abrupt or develops gradually over a period of a few days, with severe headache, moderate or low fever, stiffness of the neck, stiffness or pain in the low back, vomiting, and constipation or diarrhea, although frequently no bowel change is noted that is not consistent with anorexia and lack of food intake. (Symptoms with reference to the bowel vary in different epidemics; diarrhea was frequently noted in those cases occurring in Los Angeles during the third decade of this century.) If the patient flexes his neck to bring the chin against the chest, the maneuver elicits pain either in the neck or in the lumbar area. Frequently the patient cannot accomplish the flexion, and when it is done by the physician with the patient recumbent, the knees draw up (Brudzinski's sign). Likewise, if the patient can sit erect with legs straight before him on the bed, he cannot reach forward and touch his toes, nor can he bend his back to place the head between his knees. Head drop also may be present. Mild paresthesias are not uncommon. Changes in the superficial reflexes usually occur first, then in the deep reflexes, and finally paresis or paralysis. Tightness in the muscles of the back and hamstrings becomes apparent. (This is

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commonly called spasm, although neurologists uniformly object to this appellation upon etymological grounds.) The onset of the usual case of poliomyelitis and that of the second phase in the biphasic type are alike in all respects. The pulse is disproportionately rapid in relation to fever and often remains fast after fever subsides.

In the biphasic cases, the first phase is one of minor illness during which the virus is producing a systemic disturbance,[5] probably multiplying in the alimentary tract, just as in the abortive type which does not go on to a second phase in which the nervous system is involved. This first phase is not to be construed as prodromal, or as a preceding separate and distinct illness, for the virus is present and active in the host at this time, and may be proven present in the stools. The symptoms of the first phase are the same as those of abortive poliomyelitis. These symptoms last for a day or two, then disappear. After an interval averaging four days, the second phase follows.

The author has never known vigorous exercise, when taken at or about the time of onset, to increase the severity of the illness in patients who subsequently had what was believed to be abortive poliomyelitis. The same may be said with regard to patients who actually were in the first phase of the biphasic type. On the other hand, such exercise at the onset of the second phase of the biphasic disease, as well as in all types of monophasic poliomyelitis, appears to increase the severity in nearly every instance—probably causing the death of some patients who otherwise might have survived.[3]

When the virus attacks the nervous system, the changes it produces can be observed at autopsy in some degree from the forebrain to the cauda equina. Such changes also have been repeatedly observed in the dorsal root and the various sympathetic ganglia, in the sympathetic fibers accompanying blood vessels, and in the lateral column of Clarke, as well as in the anterior horn of the cord. It must be apparent, therefore, that symptoms will vary as the disease progresses, depending upon the virulence and quantitative multiplication of the virus at different levels in the central nervous system. It must be apparent also that all manner of combinations may be present: The lumbar cord with one or both legs involved; the cervical cord, with one or both arms, or the phrenic nerves and paralysis of the diaphragm; ascending types like Landry's paralysis; descending types, rarely mentioned in the literature; involvement of the trunk with muscular paralysis. with paralytic ileus or cord-bladder, or intercostal weakness and respiratory distress; the involvement of the medulla, with difficulty in swallowing, facial palsies, paralysis of the vocal cords and of the extrinsic muscles of the eyes; or involvement of the cerebrum to produce encephalitic changes. All of these changes may occur, singly or in various combinations, to produce greatly varying pictures. Indeed, in very small children, paralysis may be the first symptom noted.

Spinal fluid changes observed in poliomyelitis are: (1) Changes in pressure, varying from normal to very high, but usually 130 to 180 mm. of water. (2) The presence of cells, varying from none to over 1,000, but usually 18 to 200 per cubic mm. Early in the course of the disease the cells often are neutrophils, and later there is a preponderance of monocytes. (3) Increase in the total protein content, usually to 60 to 80 mg. per 100 cc. but occasionally to 200 to 500 mg. per 100 cc. The sugar content is normal, but should always be determined because it is low or absent in the presence of tuberculous meningitis with which poliomyelitis is very frequently confused.

In differential diagnosis, all diseases which produce flaccid paralysis, or which cause symptoms simulating those of non-paralytic poliomyelitis, must be considered. Usually, a careful history and a period of observation will permit differentiation of these various conditions, but early in the course of the disease the differentiation may be exceedingly difficult. Tuberculous meningitis is one of the diseases most often mistaken for poliomyelitis. The low content of sugar in the spinal fluid, and later the low content of chlorides, are fairly diagnostic of tuberculous meningitis, however, and demonstration of the tubercle bacillus clinches the diagnosis.

Mumps meningitis is very common and, in the absence of parotitis, may not be distinguished from poliomyelitis except by complement-fixation or other laboratory procedures. From recent sampling, it would appear that some poliomyelitic patients, within six weeks after onset, develop complement-fixation in low titers against mumps. This phenomenon requires clarification and the study is being continued by the Los Angeles City Health Department. The reaction may be non-specific or anamnestic.

Encephalitis of other origin occurring during poliomyelitis epidemics cannot be differentiated from polioencephalitis by clinical methods. In such cases, virus and serological studies, rarely immediately available to the clinician, are required. Encephalitic involvement without some bulbar or spinal involvement must be considered rare in poliomyelitis.

In November 1949, Curnen[1] reported that a virus pathogenic for infant mice was producing in human patients in Rhode Island a disease simulating poliomyelitis with paralysis. Ten cases of this disease were observed in a group of 157 patients believed to have poliomyelitis or aseptic meningitis. (The author has been unable to diagnose any such case in the Los Angeles area.)

The Guillain-Barre syndrome, or infectious neuronitis, should not be difficult to distinguish from poliomyelitis. In infectious neuronitis there is a history of some preceding disease or infection in over 70 per cent of the cases; fever is frequently absent; many of the patients are in older age groups; the paralysis involves all extremities and sensory changes are present; there are no cells in

the spinal fluid, and the spinal fluid protein is very high, usually 500 to 1,000 mg. per 100 cc. In most cases in which, during epidemics of poliomyelitis, infectious neuronitis was diagnosed and the patient died, autopsy findings were typical of poliomyelitis. During poliomyelitis epidemics, then, a diagnosis of infectious neuronitis should be made with extreme care.

Poliomyelitis is frequently mistaken for influenza, particularly before the onset of paralysis. Observation will usually settle the diagnosis within a few days.

All told, patients with 108 different disease entities have been sent to Los Angeles County General Hospital because of suspicion of poliomyelitis, and differentiation was required. A careful history, necessary laboratory procedures, animal inoculation, x-ray studies, and observation over a suitable time interval, all may be necessary in a given case to establish the correct diagnosis or to rule out poliomyelitis.

The poliomyelitis epidemic of 1948 was the most severe ever experienced in Southern California. At that time, many changes were made in the treatment of patients who had respiratory impairment. The measures included tracheotomy, endotracheal suctioning of mucus, positive pressure air or oxygen administration, antibiotic therapy against secondary infections, and the development of an enlarged consultant staff as a team to meet the various exigencies arising from a total hospital load of 3,094 cases.

The staff of this team contained representatives of the following specialties: anesthesiology, gynecology and obstetrics, surgery, orthopedics, otolaryngology (including bronchoscopy), physiatry, urology, neurology, cardiology, neurosurgery, and biochemistry. The team also included specially instructed nurses, and a mechanical engineer. Pathologists and physiologists were frequently consulted. Electricians were immediately available 24 hours daily to act in event of power failure. A psychiatrist should have been part of the team, but none was available. This team was invaluable in shortening the time necessary to establish the correct diagnosis in puzzling cases, as well as in saving lives through improvising on-the-spot or long range treatment procedures for the various bizarre and numerous complications constantly arising.

Electrophrenic stimulation was tried and discarded as thoroughly impractical.

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Treatment of Poliomyelitis with Involvement of the Respiratory System

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SUMMARY

The mortality rate of poliomyelitis may be reduced by early measures to prevent anoxia and its subsequent complications.

Constant nursing care, early tracheotomy, the giving of oxygen, proper use of the respirator and positive pressure equipment are essential in the proper management of patients with poliomyelitis who have respiratory involvement.

THE management of the patient who has poliomyelitis and interference with respiration offers a challenge to the clinician. It is from this group of patients that the mortality rate for this disease is derived. If lives are to be saved, life-saving procedures must be instituted early in the course of the disease. Treatment must be directed toward prevention of fatal complications.

Successful management in such cases requires teamwork by experienced personnel and availability of adequate equipment and facilities. The burden of patient care rests with the nursing staff and they must be instructed in the newer approach to treatment and what they are expected to do.

Complications which most often prove fatal are prolonged anoxia, atelectasis, pulmonary edema and disturbance of blood electrolytes and serum proteins. Treatment must be such as to prevent or to correct these complications as they develop. The cause of anoxia should be determined and, if possible, corrected. Prevention of anoxia may be accomplished in many instances by the early performance of tracheotomy and use of the respirator.

Information presented herein is based on observations of more than 6,000 patients with poliomyelitis treated at the Los Angeles County General Hospital in the four-year period 1946-1949. Tracheotomy was done in 357 cases. Use of a respirator was required in 495 cases.

Indications for tracheotomy are (1) occlusion or impending occlusion of the airway due to secretional obstruction, which is aggravated by the inability of the patient to swallow, cough or maintain a free airway, and paralysis or spasm of the vocal cords; (2) massive atelectasis; (3) development of respiratory symptoms requiring a respirator, in a patient previously able to void the secretion of mucus; in such patients the intrathoracic negative pressure increases due to the partially obstructed airway, and mucus then is sucked into the lower bronchial tree, causing plugging and atelectasis; (4) persistence of cyanosis in spite of what seems to be adequate respiratory exchange; and (5) physical resistance by the patient to the aspiration of mucus from the respiratory tract.

Advantages of tracheotomy are as follows: (1) A clear airway is assured. (2) Suction and bronchoscopy may be performed easily. The cooperation of the patient for such procedures is not required. (3) Positive pressure may be readily applied for improvement of ventilation, prevention of pulmonary edema and atelectasis. (4) For many patients it has proven to be a life-saving measure.

Early tracheotomy is stressed. If the procedure is performed before any emergency sets in, bronchoscopy may be carried out, mucus or plugs removed, oxygen supplied through the bronchoscope tube and a more leisurely operation performed over the tube. This is urged in the performance of tracheotomy on all patients but particularly children. The incidence of pneumothorax and subcutaneous emphysema will be reduced.

The Bennett flow-sensitive intermittent positive pressure unit is of great value in the performance of tracheotomy on the patient who requires respiratory assistance. The patient is assured adequate ventilation throughout the entire procedure. If he is capable of initiating or maintaining his own breathing, this machine offers no interference.

A high tracheotomy is preferred. The trachea should be entered at the level of the second tracheal ring. It may be necessary to sever the isthmus of the thyroid. Bleeding should be anticipated and adequately controlled. High tracheotomy simplifies subsequent nursing care for the respirator patient. It is wise to use the largest tracheotomy tube compatible with the diameter of the trachea. However, the tube should not reach the bifurcation of the trachea.

To prevent complications due to electrolyte imbalance it is necessary to obtain blood sodium, chloride, carbon dioxide, potassium and pH determinations. The blood pH is of the utmost importance. It is the best way to distinguish between respiratory acidosis and true alkalosis. In both conditions the carbon dioxide combining power is elevated. However, if the blood pH is low the conditions should not be confused. The treatment for respiratory acidosis is improvement of ventilation.

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Gastric suction with removal of chlorides, and the injudicious use of sodium, may cause alkalosis in some cases. The treatment of this condition is the intravenous administration of ammonium chloride and normal saline.

Total proteins may be reduced and the albumin-globulin ratio often is reversed. Administration of plasma intravenously is the treatment of choice.

If the patient has some degree of interference with respiration but a respirator is not needed, the following program may prove beneficial. (The program entails 24-hour nursing care and availability at the bedside of all necessary equipment for the care of each patient.)

Oxygen, when indicated, should be administered by nasal catheter if the patient does not have a tracheotomy. If the patient is tracheotomized there should be an adapter to connect the oxygen catheter with the opening in the tracheotomy tube. This is very important in the case of small children for whom a No. 2 or No. 3 tracheotomy tube is used, because if the catheter were to be inserted into the tube, it would further occlude the airway and impair exhalation. In such circumstances pulmonary acidosis would be liable to develop. If a larger tube is used, a small catheter may be inserted into it.

Mucus may be removed from the trachea and bronchial tree by gentle suction through the tracheotomy tube. Prior to suctioning, a few drops of normal saline solution containing 200 units of penicillin per cc. may be instilled into the tracheotomy tube. The suction catheter should be small enough to pass through the tracheotomy tube without undue force. The tip of the catheter should be rounded. The tracheotomy inner tube should be removed frequently and thoroughly cleansed.

In order to facilitate drainage of mucus, the patient may be placed in a steep Trendelenburg position at regular intervals. However, constant use of this position should be avoided as the weight of the abdominal viscera against the diaphragm might further embarrass respiration and reduce cardiac output.

It is wise to pass a Levine tube at the start of treatment. Wangensteen suction apparatus should be at hand. Acute gastric distention is common, and immediate emptying of the stomach may be a life-saving measure. Vomiting, aspiration of vomitus and occlusion of the airway may occur.

Diet: Although the patient may be critically ill, if extreme care is used a formula may be fed by continuous drip through the Levine tube. The formula should be high in protein and carbohydrate, low in fat, with essential amino acids, vitamins and potassium added. At the first sign of gastric or abdominal distention, feeding should be temporarily discontinued. The diet should be a supplement to fluids, plasma and whole blood given intravenously. As the patient improves, more calories may be given either orally or by Levine tube, depending on ability to swallow.

Pain due to muscle spasm is best controlled by use of acetylsalicylic acid and hot packs. If the pain is severe, Intocostrin® (curare extract) may be used. The results are usually excellent if adequate dosage is given.

If headache persists, spinal puncture frequently gives relief, even in those patients with low spinal fluid pressure. Headache may be due to anoxia and in such cases supplemental oxygen may give prompt relief. Sedation should be avoided, particularly with drugs known to embarrass respiration.

Fever may be controlled by acetylsalicylic acid (given through the Levine tube or by rectum). When the patient is critically ill and the temperature high, hot packs should not be used. It is more important that the patient be allowed to rest than to be subjected to such a fatiguing and disturbing procedure. If there is sufficient spasm of the intercostal muscles and diaphragm to embarrass respiration, Intocostrin® and hot, light compresses should be used.

The pulse and blood pressure should be checked frequently and the patient observed for any change in respiration. A respiratory ventilation meter for the measurement of tidal ventilation has been developed recently. Frequent use of this instrument helps to determine when a respirator is indicated. However, clinical experience alone will generally enable one to determine when patients need assistance.

To combat secondary infection, penicillin in routine dosage should be given to patients who are tracheotomized or who have involvement of the muscles of respiration. If the patient is unable to void urine, catheterization should be done when necessary. In-dwelling catheters are occasionally necessary.

Abdominal distention is treated by Wangensteen suction, rectal tube, neostigmine, and hot compresses.

When the patient's condition is no longer critical a program of physical therapy should be instituted.

CARE OF THE RESPIRATOR PATIENT

If signs of anoxia develop in a patient with a clear airway, a respirator should be used. Mechanical assistance is not contraindicated in the treatment of bulbar poliomyelitis. Pulmonary edema is liable to supervene without warning if clinical cyanosis is allowed to develop. Often the first signs of anoxia are headache, increase in the pulse rate, sweating of the forehead, restlessness and anxiety. Irreparable damage to the central nervous system may be prevented if the patient is offered respiratory assistance prior to becoming irrational and semi-comatose.

Before placing the patient in a respirator, if a tracheotomy has not been performed, the advantages should be considered and a decision reached. With adequate equipment and help it may be performed later. However, to avoid emergency procedures is a step toward saving lives. The patient should be told why a respirator is necessary and instructed as to how to breathe with the machine.

NEW EQUIPMENT

To prevent complications which in the past have proved fatal to the respirator patient, new equipment was devised at the Los Angeles County General Hospital. This equipment consists of a positive pressure attachment which operates by means of a small bellows in synchronization with the respirator. When the respirator is in a negative cycle the positive pressure unit is in a positive cycle. Air is forced under pressure through the tracheotomy tube.

This is important in overcoming the increase in intrathoracic negative pressure due to the partially occluded airway. Better ventilation is obtained. Because of the action of the expiratory valve the patient is not required to breathe out against any resistance other than that offered by the tracheotomy tube. Respiratory acidosis, atelectasis and pulmonary edema are reduced to a minimum. Air, oxygen or oxygen and helium may be administered directly into the unit. Humidification of the gases is important. There is an air filter to reduce the hazard of infection of the trachea due to contaminated room air.

In order to improve the respiratory pattern of the respirator, a cam was developed. The cam makes possible a slow, uniform inspiratory pressure rise and a rapid expiratory flow simulating the pattern of normal respiration. Chest pain presumably due to an increase in intrathoracic negative pressure has been eliminated. Adequate ventilation can be obtained with lower pressure settings than were used previously. Thus, tidal ventilation is increased by combination of the positive pressure unit and the cam. The equipment is a valuable adjunct to the management of the tracheotomized patient who requires a respirator. It should be employed as soon as the patient is in the respirator. Its use allows time to make all the necessary adjustments without undue haste.

If the patient is unable to synchronize with the respirator, hot packs should be placed against the chest and Intocostrin® should be given. Several doses of the drug may be required. If the patient's inability to synchronize with the respirator is due to pulmonary acidosis, positive pressure will correct this incompatibility.

As soon as the patient is adapted to the respirator, routine procedures may be carried out. It is important that pressure points be well padded. The collar should not cause the patient any discomfort and it should be pushed well into the respirator by a metal shield to allow adequate room for the care of the tracheotomy tube.

During the first few days in the respirator, most attention should be directed toward keeping the patient alive. Care of the patient's body should be reduced to a minimum. To keep the airway free, removal of mucus may require the full attention of a nurse. If the patient is to be saved it becomes a matter of 24-hour nursing care, properly functioning equipment, and fluid balance.

A common error is neglecting to remove mucus from the main bronchi by suction. A clear upper airway does not mean that the main bronchi are free of mucus. Accumulation of mucus leads to anoxia and its complications. Nurses must understand the importance of maintaining a free airway. If cyanosis persists after proper suctioning, bronchoscopy should be performed.

Rules governing the feeding of the non-respirator patient apply equally well to the patient in a respirator. Gastric distention is more common and it is often necessary to use Wangensteen suction. However, the importance of maintaining normal protein values is well established and it is advisable to feed the critically ill patient. When food is offered by mouth, the diet should be appetizing, non gas-forming and highly nutritious. The difficulty connected with swallowing due to the action of the respirator requires that adequate time be allowed to feed the patient properly.

Plasma, whole blood and other fluids should be given as indicated. It is important to carry out blood chemistry determinations at regular intervals. Blood pressure should be checked frequently. Periodic x-ray films of the chest blood cell count, urinalysis and culture of blood should be obtained periodically. If positive pressure is available the purely mechanical difficulty of obtaining the specimens is reduced to a minimum.

Mechanical accidents occur. The best safeguard is to know what might happen and to take steps to prevent it. By far the most common accident is a leak at the collar, permitting the respirator pressure to fall. Respirator ports may be left open, or they may work loose. A reliable warning device connected with the respirator is desirable. If positive pressure is being used, death may be avoided but such an accident always causes the patient considerable anxiety and increases the demands made on the nursing staff.

The patient may need *constant* supplemental oxygen. Oxygen tanks should not be permitted to become empty. The oxygen gauge should be turned toward the nurse.

Suction machines should be in good working order. An adequate supply of suction catheters should be at hand, as they are easily contaminated.

It is important to change the tracheotomy tube at frequent intervals. However, it should not be removed during the first 24 to 36 hours. It may be exceedingly difficult to replace before a track is established.

The speed of the respirator must be watched. The ideal speed is that which assures the patient adequate ventilation without producing hyperventilation syndrome. With positive pressure and the cam, adequate tidal air is obtained at fairly low pressure settings. The proper pressure may be determined by frequent use of the respiratory ventilation meter. A tidal ventilation of 400 to 600 cc. is adequate.

To aid in drainage of mucus, the respirator may be tilted. However, the Trendelenburg position must not be used over a prolonged period. When the position of the respirator is changed, examination

for possible pressure leaks should be made. It is important that the patient's collar does not impede circulation.

In order to withdraw the patient from the respirator and to carry out proper nursing procedures, positive pressure equipment should be used to maintain adequate ventilation. This equipment also permits packing the patient and starting physical therapy at an early date.

There are many complications common to the respirator patient which require early detection and careful management. Pneumonia and infections of the urinary tract are common. Treatment depends upon the causative organism. Decubitus ulcers are a problem. Air mattresses, frequent changing of the patient's position and maintenance of normal protein values are of help. Sinusitis may develop due to the disturbance of the nasal passages by frequent suction and the presence of a Levine tube. This condition may be reduced to a minimum by frequent changing of the tube, nasal shrinkage and topical application of antibiotics. Infections of the trachea secondary to tracheotomy and trauma, due to suction catheters, are frequent. A common offender is Pseudomonas aeruginosa. The most efficacious treatment has proven to be sulfonamides and streptomycin. Bacteremia due to the previously mentioned organism and occasionally E. coli, may occur. Streptomycin, aureomycin and chloramphenicol are the drugs of choice in the treatment of this complication. Hypertension may develop, the cause of which is usually obscure. Psychiatric problems arise. It is urged that a psychiatrist be in attendance to direct proper treatment.

Every encouragement possible is given the patient. Immediate members of the family are constantly warned against doing or saying anything which might conceivably upset the patient. Morale is an important factor in recovery.

A sincere attempt should be made to segregate the new, acutely ill patient from others who have the first few days of their illness behind them. The possibility of secondary respiratory infection must be guarded against. Penicillin should be used routinely in adequate dosage.

Patients should be removed from the respirator as soon as possible. However, it is a mistake to attempt to remove a patient from a respirator if the respiratory exchange is inadequate. This leads to disaster. By frequent use of the respiratory ventilation meter this error may be avoided.

The rocking bed, which is relatively new in the treatment of poliomyelitis, will undoubtedly contribute to satisfactory early removal of patients from the respirator. However, experience gained by limited use of this equipment indicates that care should be taken that the patient has adequate ventilation before the bed is used. It may give the necessary assistance to borderline patients and permit good physical therapy at an early date. Perhaps the rocking bed will be the answer to the so-called respirator-fast patient. Experience will determine the answer.

Before attempt is made to remove the tracheotomy tube, the patient should be able to get along without supplemental oxygen. If this is accomplished over a period of days, a small tracheotomy tube may be substituted for the larger one and be closed off. If, in a matter of two or three weeks, the patient has not required suctioning through the tracheotomy tube, it may be removed. Positive pressure may be administered by mask in order to continue adequate nursing care and physical therapy. If a condition arises which impairs the patient's ventilation, another tracheotomy should be carried out without hesitation.

In the management of the respirator patient, it is extremely important that physicians and nurses secure the patient's confidence.

Alterations in Serum Protein Levels in Acute Human Poliomyelitis: Rationale for Therapy

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SUMMARY

Serial determinations of serum protein levels in acute human poliomyelitis revealed a progressive drop of the serum albumin level which bore close relationship to the amount of clinical paralysis. This loss of serum albumin began about the third day after onset of clinical symptoms and progressed to the tenth day or longer. The more severe the clinical involvement, the less was the tendency to spontaneous correction of the albumin deficiency. Declining serum albumin levels were concomitant with progressively rising serum globulin values.

When pooled irradiated human blood plasma was administered, the depleted serum albumin levels were stabilized or made to approach normal, depending upon the severity of clinical involvement. It is felt that the administration of blood plasma resulted in definite clinical benefit with regard to the severity, extent, and duration of paralysis.

SPORADIC reports in medical literature have attributed beneficial results to the administration of whole blood serum or plasma[3, 4, 5] in acute human poliomyelitis. Other reports have stated that no apparent benefit results from administering large amounts of gamma globulin,[1] in spite of experimental evidence that strains from the three recognized types of poliomyelitis virus are agglutinated experimentally very readily by gamma globulin derived from pooled human plasma.[2] No specific rationale has been advanced to justify therapy with blood plasma. Although use of plasma was on an empiric basis, the results in a few reported instances were described as dramatic. For that reason and because of other studies soon to be reported, systematic investigations of the blood electrolytes and serum protein levels in acute cases of human poliomyelitis were made during the epidemic of 1948 which occurred in Los Angeles County. During the epidemic, 3,165 cases were reported and 3,094 of the patients were admitted to the Los Angeles County General Hospital. The impact of such a case load of this crippling disease provided impetus to reexplore old therapeutic possibilities and to search for new.

Pilot observations of the serum protein levels in a group of 40 consecutive patients, all severely ill and all confined to respirators, revealed unexpected and startling alterations from normal. During the time these striking protein changes became apparent in the laboratory, gross peripheral edema also was evident in many of these patients. There was no apparent reason for the appearance of the edema. The period during which nutrition had been withheld was too brief for edema to have resulted, and the volume of parenteral fluids was insufficient to have contributed to edema. Obviously, further investigation into the entire subject of serum protein levels, especially albumin fractions, was imperative.

The correlation between low serum albumin and peripheral edema has long been established and accepted in cirrhosis of the liver, nephrosis, and other clinical diseases. A question that arises, then, is: If peripheral edema occurs — and peripheral edema was present in many of the patients observed — is it not feasible for interstitial edema to occur within the central nervous system and contribute to the paralysis? It has been observed frequently in this disease that the onset of paralysis occurs suddenly and extensively; also that its disappearance may follow the same variable course without adequate explanation: The nerves do not function but could not have been destroyed.

In order to explore the patterns of serum protein changes, it was decided to determine serum protein levels with albumin-globulin fractions in cases of graded severity. For this purpose, all cases in this study were empirically classified into three categories:

I. *Mild*—Cases of non-paralytic poliomyelitis, or cases in which there was paresis or paralysis totaling less than one-third of the body musculature. No cases of bulbar involvement were included.

II. *Moderate*—Cases in which there was paresis or paralysis of more than one-third of the total body musculature. Bulbar involvement was not excluded if the use of a respirator was not required.

III. *Severe*—Cases in which there was paresis or paralysis of more than one-third of the body musculature. Patients in this classification all had respiratory muscle or bulbar involvement, had had tracheotomy, and were in respirators.

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The study here reported was aided by grants from the College of Medical Evangelists and from the National Foundation for Infantile Paralysis.

No equivocal cases were accepted for this study. It was not necessary to include borderline or transitional cases which could not be fitted into the three categories.

TABLE 1.—*Clinical Severity of Cases Studied: 75 Cases*

	Mild	Moderate	Severe
47 cases (Controls—conventional treatment only)	25	13	9
28 cases (Treated—conventional treatment plus plasma)	4	9	15

In each case studied serum protein levels and albumin-globulin fractions were determined daily for five days from the date of admission to the hospital. The day of admission to the hospital invariably was the day on which the case was accepted in this study. Following these initial determinations, levels were determined every second day for an additional five determinations; and if the patient remained in the hospital, levels were determined every third day thereafter. For those patients who were to be treated, levels were determined daily until the day of treatment, and on each treatment day the levels were determined before blood plasma was administered. At the termination of plasma treatment, invariably five consecutive days, levels were determined as before, every two days for five determinations, and every three days thereafter until the patient was discharged from the hospital. The plasma used for treatment in this study was pooled, irradiated human blood plasma, given in a dosage of 5 cc. per pound of body weight daily, for a minimum consecutive period of five days. With few exceptions, no more than 1,000 cc. of plasma was given to a patient on any single day.

It should be stated that all patients observed during this epidemic were given routine care and treatment. No specific measures were used either in diagnosis or treatment that would differ materially from the routine care given elsewhere to patients with acute poliomyelitis. Upon institution of this study, consecutive cases were accepted into the series, classified, and the patients observed closely in the manner described. In alternate cases, with few exceptions, in addition to the usual measures employed at this hospital, pooled, irradiated human plasma was given intravenously in the manner related. For purposes of description in this study, the cases in which plasma was given are considered "Treated" cases, as contrasted to the alternate paired cases of comparative severity in which plasma was not given and which are regarded as "Controls." "Treatment," as here used, means administration of plasma according to the previously stated schedule.

All laboratory determinations were performed in a research laboratory organized specifically for this project. Blood samples in which hemolysis was noted were discarded and new samples obtained. The serum proteins were separated by Howe's sodium sulfate method[6] and measured by the biuret method of Kingsley.[7] By this method the alpha globulin fraction is thrown down with the albumin. The computed error by which the albumin fractions are thus increased over true values ranges from 20 per cent to 35 per cent, or from 0.75 gm. to 1.25 gm. per 100 cc. It was technically not feasible to correct the values for this error; the albumin values in these protocols are therefore significantly above true value, especially since in this disease the globulin is shown to be elevated.

Almost without exception, about the third day of clinical illness, regardless of the severity of involvement, there was a progressive decline in the serum albumin in direct proportion to the severity of the paralysis. This decline, which began about the third day, tended to reach its greatest subnormal value by the tenth day. Subsequent clinical relapses in severe cases were again mirrored in a decline in albumin levels from the previous level. At the same time that albumin levels declined, the serum globulin values rose in direct proportion to the severity of the clinical involvement and continued to rise far into convalescence.

In the cases of mild involvement, the serum albumin levels tended to return to normal spontaneously, a trend evident by the tenth day. In cases of moderate involvement, the drop reached its maximum by the tenth day and showed a tendency gradually to return to normal, but the level did not reach a normal for some time; in fact, at the end of three to four weeks of observation in the cases that were followed for that length of time, levels had not yet attained normal. In the severe cases, albumin depression was most severe by the tenth day of illness and showed little or no tendency to revert toward normal. In some severe cases followed for periods of 60 to 90 days, serum albumin levels still were low at the end of that time. In the event of clinical relapse, or extension of paralysis, the partial stabilization at a subnormal level that had occurred was disrupted and further reductions took place. Albumin-globulin ratio reversal was common.

Because of the usual delay in diagnosis and in the hospitalization of patients after the onset of symptoms, treatment was not initiated before the dropping serum albumin level became evident. As a rule, treatment was initiated as soon as possible after the case was accepted for this series.

In the *mild* cases, it was found to be possible not only to halt the decline in albumin level, but actually to raise the level above normal. Probably in most such cases, treatment would not be indicated. In those treated, the patient appeared able to maintain the serum protein levels at or near normal values, and clinical progression of paralysis was arrested or even regressed.

In the *moderate* category, it was possible to stabilize the serum albumin level at whatever level was found present at the onset of therapy. At times it was possible to raise the albumin level to normal, but as a rule it remained slightly subnormal. After therapy was terminated, subnormal albumin levels

persisted for many weeks. There appeared to be little or no intrinsic ability to sustain an artificially elevated albumin level.

In the *severe* class, the maximum benefit obtained from the schedule of therapy used was the temporary stabilization of the dropping serum albumin level. There was little significant tendency shown for it to revert toward normal, and virtually no evidence to indicate that patients could retain the temporary benefit of replacement. When therapy was stopped, the tendency was for the albumin level to resume the decline progressively over an unpredictable period of time (see Charts 1, 2, 3, and 4).

CLINICAL IMPLICATIONS

At the time each case was accepted for this study, each patient was seen by the same staff member* and assigned to one of two well trained physical therapists for complete grading of muscle function. The same technician repeated the muscle grading on the third, seventh, 14th and 21st hospital days. Because of the desire to keep evaluations unbiased, the therapists were not indoctrinated into this program.

The value of plasma therapy is debatable in the mild cases. In those cases the patients appeared to do equally well with or without therapy. The ability to produce serum albumin levels greater than normal is of questionable value. In this report only typical cases were included, and in this discussion no consideration is being given to those patients in whom poliomyelitis progressed from mild to severe. That such progression does occur, however, provides a basis for argument for protein therapy in all cases.

The number of *mild* cases treated was small, for several reasons: (a) the consistency of the favorable response, as indicated by laboratory tests, to the

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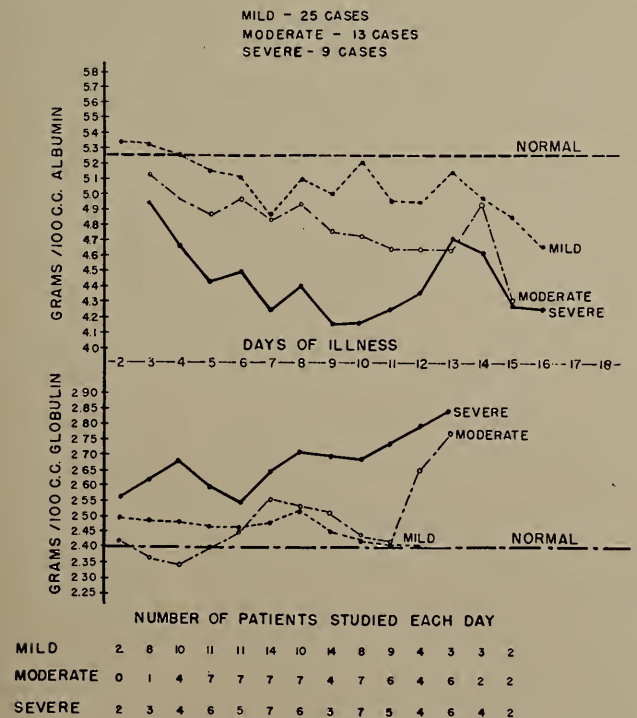

Chart 1.—Serum Protein Levels in Poliomyelitis.

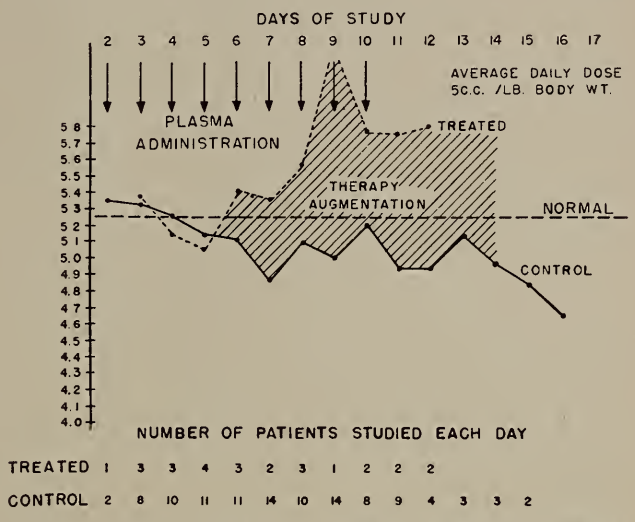

Chart 2.—Serum Albumin Levels in "Mild" Poliomyelitis.

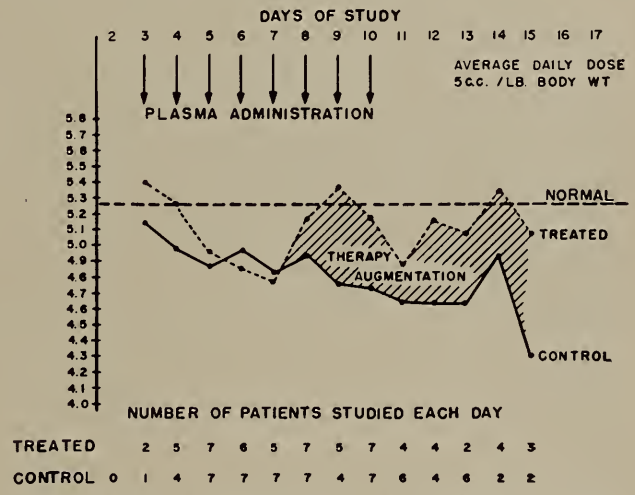

Chart 3.—Serum Albumin Levels in "Moderate" Poliomyelitis.

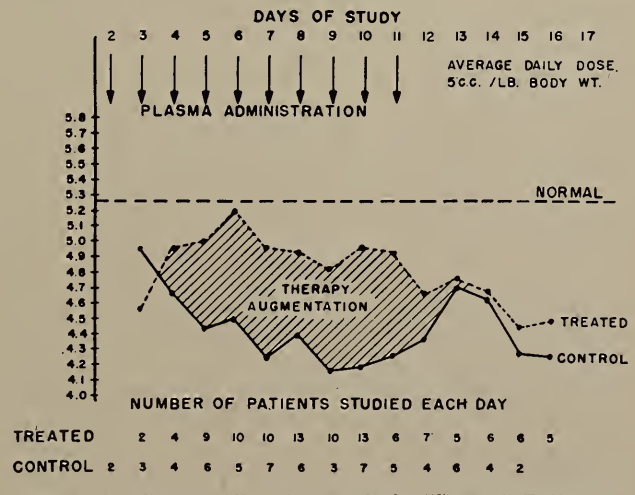

Chart 4.—Serum Albumin Levels in "Severe" Poliomyelitis.

albumin levels; (b) the greater burden of more severely ill patients in *moderate* and *severe* category; and (c) the limitation of supplies of irradiated plasma for this study. Within the small series of treated cases there were no instances of progression observed. On the other hand, in the control series there were repeated instances in which *mild* cases progressed to a more severe category and in which plasma was then given with benefit. These cases, however, were dropped from the series because they did not lend themselves readily to inclusion in this report. When a sufficient number of such instances have been observed and analyzed, future reports will be submitted if data warrant.

In the *moderate* cases, protein therapy produced notable diminution of toxicity. In addition, completed protocols, including the muscle grading charts, warrant the opinion that replacement therapy is of definite value. The dosage of 5 cc. per pound of body weight every 24 hours is probably adequate, but should be carried on longer than five days. It probably should be continued until such time as the laboratory tests reveal a reversion of the serum albumin level to normal over a period of several days.

It is felt that the greatest benefit of protein therapy was to patients in the *severe* category, despite the impression that the dosage used was inadequate and the period of therapy not long enough. Observations made subsequently revealed that larger doses of plasma than those used in this study could not return the serum albumin level to normal. The latter studies were not amplified, but indicated that in the catabolic phases of the illness the replacement therapy was of appreciable benefit: There was a definite diminution of toxemia and an appreciable stabilization, albeit temporary, of the progression of paralysis. There were repeated instances of comatose patients returning to consciousness with plasma therapy, only to relapse after therapy was terminated.

To attain maximum benefit, plasma therapy should be instituted as soon as possible. It was not unusual in the control series, especially in the *severe* category, for relapse to follow temporary clinical stabilization. Because of the critical status of these patients plasma therapy was instituted according to this schedule. Its benefits were easily apparent, but were probably not as efficacious as they might have been if therapy had been instituted earlier. There are no available criteria as yet to prognosticate relapse. The severity of relapse, on the other hand, is well mirrored by falling albumin levels.

DISCUSSION

The authors are aware of the danger of drawing conclusions from a small series of cases. That poliomyelitis is a disease both protean and variable in its manifestation and course is well appreciated, especially since there are no coldly objective criteria of improvement which are not duplicated spontaneously regardless of therapy. Nevertheless, based upon the clinical observation of over 6,000 cases of acute human poliomyelitis in four years, it is felt that an expression of opinion is warranted.

The startling consistency with which depleted serum albumin levels occur in acute human poliomyelitis is a significant contribution to the litera-

TABLE 2.—*Albumin and Globulin Values by Serial Days in Three Patients with Severe Poliomyelitis*

Normal Values: Serum albumin—5.26 grams/100 cc.
Serum globulin—2.31 grams/100 cc.

CASE 1

Days of Illness	Albumin grams/100cc.	Globulin grams/100cc.
13	3.09	3.42
15	2.58	2.95
19	2.71	2.66
23	3.11	3.34
26	3.18	3.41
(Patient relapsed—Condition critical—Plasma given as indicated by symbol Pl.)		
27	3.55	3.61—Pl.
28	3.66	3.75—Pl.
29	....	....—Pl.
30	4.66	3.51—Pl.
31	4.02	3.41
33	3.80	3.00
(Patient unable to maintain levels)		
37	3.80	3.17
40	3.69	3.05
50	4.11	3.00
55	3.73	2.97
60	3.95	2.97
74	4.11	2.93
(Patient lived—Maximum paralysis—Transferred out of hospital in respirator)		

CASE 2

Days of Illness	Albumin grams/100cc.	Globulin grams/100cc.
4	5.04	2.98
5	4.22	2.64
7	4.11	2.12
8	4.38	2.53
10	4.56	2.83
12	4.20	2.76
14	3.66	3.24
(Died on fifteenth day—No treatment)		

CASE 3

Days of Illness	Albumin grams/100cc.	Globulin grams/100cc.
5	4.24	3.24
6	3.98	3.10
7	4.13	3.07
8	4.06	2.63
9	3.18	3.24
(Reversal of ratio)		
10	3.57	3.32
11	4.13	2.44
12	4.15	2.53
13	4.08	2.48
21	4.40	2.85
39	4.20	2.46
59	4.66	2.63
67	4.75	2.32
(Patient lived—No treatment)		

TABLE 3—*Magnitude of Serum Albumin Loss in "Severe" Cases*

Patient	Amount of Serum Albumin Reduction per 100 cc. Serum
1	.5 grams/24 hours
2	.2 grams/24 hours
3	.7 grams/72 hours
4	1.0 grams/72 hours
5	1.1 grams/72 hours
6	.8 grams/72 hours
7	1.0 grams/72 hours
8	2.1 grams/ 6 days
9	1.3 grams/ 4 days
10	1.0 grams/ 2 days
11	1.7 grams/14 days
12	2.3 grams/14 days
13	1.4 grams/ 4 days
14	1.7 grams/10 days

ture and knowledge concerning poliomyelitis, which up to the present time has not been publicized. That this depletion of serum proteins occurs in linear relationship to the severity of paralysis appears to be highly significant. Serum albumin levels of equal magnitude are accepted without dispute as the cause for peripheral edema in other clinical entities. The effects of transfusion of immune bodies in the plasma utilized can be reasonably discounted from the work of Bahlke and co-workers in 1945.[1] The study being presented represents the first known attack therapeutically on a hitherto undescribed physiologic deficiency occurring in human poliomyelitis.

In addition to the data presented here, serum albumin patterns have now been followed in approximately 150 cases (more than 1,600 determinations having been made) and these are consistent in all details with those in the series reported. It remains for others to repeat and substantiate this work in an attempt to crystallize thinking on the benefits which are felt to accrue from the administration of pooled, irradiated human blood plasma in adequate amounts to patients with early poliomyelitis over a sufficiently long period.

It can be stated with assurance that in the *mild* and *moderate* categories not only did results of laboratory tests confirm benefits from administration of plasma, but in no case in the series in which plasma was given early was there clinical progression into a more severe category. Observations within the *severe* group are more controversial, for reasons previously stated. Table 2 presents data that are interpreted as evidence of both laboratory and clinical benefit following treatment as outlined.

TABLE 4.—*Estimate of Clinical Results from "Muscle-Grade" Charts Plus General Clinical Evaluation. (Observations from the Third to the Fourteenth Hospital Days.)*

Category	No. of Cases	Stationary	Progressing	Improved
Mild—not treated	25	17	6	2 (8%)
Treated	4	2	1	1 (25%)
Moderate—not treated	13	8	4	1 (9%)
Treated	9	4	3	1 (23%)
Severe—not treated	9	0	8	1 (10%)
Treated	15	3	8	4 (27%)

It is the primary purpose of this report to describe the acute changes in serum protein levels in human poliomyelitis. These changes have not previously been reported. Secondarily, it is desired to elucidate a rationale for treatment with plasma as well as to report observations in a limited series with such treatment (Tables 2, 3, and 4).

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Biochemical Alterations in Acute Human Poliomyelitis: Electrolyte Patterns and Trends

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Albert L. Chaney, Ph.D., *Los Angeles*

SUMMARY

Pronounced alterations occur in the biochemical findings in acute poliomyelitis. These are derived from three major mechanisms: (a) inefficient pulmonary gaseous exchange, resulting in respiratory acidosis; (b) profound changes in nitrogen metabolism, resulting in decreased serum albumin, tissue destruction, and increased urinary nitrogen; (c) losses of electrolytes through extrarenal channels such as lung and tracheal secretions, sweating, and gastrointestinal disturbances.

The extent of these alterations may be defined by appropriate serum and urinary biochemical determinations. These determinations are valuable both from a therapeutic and a prognostic standpoint. They also contribute to further understanding of physiologic and pathologic conditions in acute poliomyelitis.

As the possibility of major blood chemistry alterations in an acute infectious disease such as poliomyelitis is obvious, it is singular that few studies have been made in that field until recently.

Recent experience indicates that such changes may be of primary importance in determining the progress of the patient. In many cases, fatal termination of the illness is due largely to changes in blood electrolytes that are incompatible with continued life.

The poliomyelitis epidemic of 1948 in Los Angeles County afforded ample opportunity to observe and study these changes. The following table presents in summary some factual data with reference to the epidemic and the relation of this study to it.

As may be seen from Table 1, the 1948 epidemic produced an unusually large number of severely ill patients requiring respirator treatment. This intense case load emphasized the problems of clinical management, and stressed the lack of available information relative to altered physiologic states and biochemistry in this disease. For example, why did many patients confined to respirators become bloated, cyanotic, encephalitic and fail rapidly in spite of all known therapeutic efforts?

In order to provide answers to these questions, special laboratory facilities were set up as rapidly as possible, and a series of studies initiated. The objectives of these studies were to determine whether changes in electrolytes occurred during the progress of the disease which could be of diagnostic, prognostic or therapeutic value.

This report describes the general plan and findings, particularly with respect to acid-base balance. It also indicates the usefulness of the various biochemical determinations utilized, particularly with regard to the clinical management of patients acutely ill with poliomyelitis.

There are three major factors which, particularly in respirator patients, may be effective in producing these extensive electrolyte changes in body fluids.

First, the control of the extent and frequency of breathing has been transferred from the natural respiratory center to a mechanical one—the respirator. This means the possibility for major shifts in acid-base balance, plasma pH, and alkali reserve.

Secondly, in common with many other acute illnesses, a profound alteration in protein metabolism occurs very promptly, indicated by increased nitrogen excretion, decrease in serum albumin, and considerable tendency toward edema.

Third, because of extensive tissue destruction, the difficulties of maintaining adequate electrolyte intake without aggravating edema, and sometimes kidney and heart failure, pronounced imbalance may occur in the distribution of the principal electrolytes, sodium, potassium, chloride, bicarbonate, etc., in the serum and extracellular fluid.

Other phases of these studies have already been reported[1, 2, 8] or reports are in process of preparation.

Procedure: The patients in this study had all been admitted to the Communicable Disease Unit of the

Table 1.—*General Summary and Classification of Poliomyelitis Cases, 1948 Epidemic*

	Cases
Total (Los Angeles County)	3,165
Total at Los Angeles County General Hospital	3,094
Bulbar, bulbospinal and upper cervical involvement	603
Mortality rate among the 603	19.4%
Respirator required	294 (peak load 82)
Tracheotomies	354
Cases with blood chemistry studies	148
(a) Blood electrolytes	60
(b) Plasma protein studies	88

From the Communicable Disease Unit of the Los Angeles County General Hospital and the Department of Medicine of the College of Medical Evangelists.

Presented as part of a Symposium on Recent Advances in Knowledge and Care of Patients with Bulbar and Respiratory Poliomyelitis before a Joint Meeting of the Sections on Pediatrics and Public Health at the 79th Annual Meeting of the California Medical Association, San Diego, April 30-May 3, 1950.

Table 2.—*Type and Frequency of Chemical Determinations*

Blood Determinations	Number
Plasma pH	355
Plasma bicarbonate	379
Plasma chloride	361
Sodium	296
Potassium	296
Calcium	42
Proteins (albumin and globulin)	2,142
Miscellaneous	208
Total	4,079

Urine	Number
pH	86
Chloride	553
Sodium	328
Potassium	328
Total nitrogen	454
Total	1,749

Los Angeles County General Hospital following a complete examination in the admitting rooms, including general physical examination, neurological survey, muscle check when indicated, complete blood cell counts, urinalysis and spinal puncture and analysis. All patients in this study fulfilled the usually accepted criteria for the diagnosis of poliomyelitis.

The treatment was that routinely used in this hospital for patients with respiratory embarrassment. The method of treatment was not altered in any way before the studies were made. Such changes as were made were not put into effect until after the determinations gave specific indication as to what changes were advisable.

As far as possible the initial chemical determinations were done at once in those cases in which the patient had to be put into a respirator, and serial determinations were made at 48-hour intervals during the period of critical illness, with less frequent measurements later until termination of the hospital stay.

Due to the tremendous case load and the limitations of the laboratory personnel and facilities, many patients suitable for the study could not be included and all the determinations originally planned for each patient could not be carried out.

ACID-BASE BALANCE

The first of the biochemical problems to receive attention was acid-base balance. Clinical observation, supplemented by preliminary laboratory work, disclosed major alterations in some cases, as shown by abnormally high bicarbonate content of the serum in the presence of a neutral or acid urinary output.

To determine the nature of this shift, laboratory determinations required were serum pH, bicarbonate content, sodium, potassium, and chloride levels. In the first series of 27 patients studied, with about 125 series of chemical determinations, three-fourths of the cases showed one or more pH values below the normal limits of 7.33 to 7.45, and in several cases values were 7.05 to 7.10.

These findings were contrary to previously held ideas, that alkalosis and hyperventilation were usually found with respirator patients.

The relationships between pH, free carbon dioxide or carbonic acid, and bicarbonate concentrations which occur in various acid-base balance disturbances have been presented in graphical form by Gamble.[6]

The pH of the serum is determined by the ratio of free carbonic acid to total bicarbonate, the normal value of the ratio being about 1:12. The free carbonic acid concentration is determined by the rate at which it diffuses into the alveolar air, an inexhaustible supply being produced continually by the normal metabolic process. Any obstruction, such as decreased volume or rate of respiration, impediment to expiration or free gaseous exchange, tracheal plugs of mucous atelectasis, or edema of the lungs, which interferes with this diffusion process will cause an increased concentration of carbonic acid in the blood and consequent acidosis. The first change involves pH only and may take place in a relatively short time. If this acidosis persists for a few hours, then the renal mechanisms for pH regulation come into play, and a retention of bicarbonate occurs, with a corresponding excretion of chloride. This tends to compensate the pH changes by returning the ratio of free carbonic acid to serum bicarbonate toward normal. Fully developed respiratory acidosis involves three alterations, namely, a decreased pH, a high bicarbonate concentration, and a low chloride level.

Table 3 shows results for two series of patients for which quite complete data are available.

About one month elapsed between the two series of determinations. Although respiratory acidosis occurred in both series, it was a much more prominent finding in the first. Probable reasons for this difference between the two series are of great interest. Undoubtedly, several factors were involved in this change. During this period, intensive studies on the

Table 3.—*Frequency of Respiratory Acidosis in Respirator Patients*

	Series A Sept. 9 to Oct. 20	Series B Dec. 1 to Feb. 20
Number of cases	27	33
Number of blood pH determinations	125	230
Number of pH values below normal	45	15
Number of cases with one or more pH values below normal	20 (75%)	8 (25%)
Number of cases with pH below normal and high bicarbonate levels	10	3
Average of pH values below normal	7.25	7.30
Range of pH values below normal	7.05-7.32	7.25-7.32

mechanical design of the respirator were carried on, and the use of positive pressure and a modified cam was begun.[2] This use of positive pressure in particular had a very distinct effect on the incidence of lung edema. A second factor was the use of plasma protein in quantities of 400 cc. to 1,000 cc. per day for a five-day period for many of the patients in the second series. This, as has been reported[1] tended to prevent the drop in the albumin-globulin ratio, and again was influential in reducing lung edema.

Previously, in the diagnosis of acidosis or alkalosis the direct determination of blood pH was used very seldom, the condition being inferred from the carbon dioxide combining power supplemented by urine pH measurements. In respiratory acidosis, however, the acidity is caused by retention of carbon dioxide, later accompanied by high serum bicarbonate levels and a compensatory drop in chloride concentration.

Accordingly, the degree of respiratory acidosis or alkalosis can only be determined by actual measurement of blood pH, either directly or by calculation from analyses of alveolar air. Commercial apparatus for accurate measurement of pH by glass electrodes is widely available and is standard laboratory equipment, but because of the very limited experience for clinical use, it has not been generally appreciated that there is a large temperature factor in this measurement, and that accordingly measurements should be made at body temperature or 37° C.[7] Since commercial electrode equipment is not easily adapted to temperature regulation, with the aid of National Technical Laboratories, a specially designed electrode system was made up which can be immersed in a water bath and which permits anaerobic handling of the blood specimen while measurement is made. With the use of this equipment, accurate pH determination of the plasma was readily made, and the true state of the acid-base balance established.

It should be noted particularly that where obstacles to free exhalation exist, it may be easier to supply oxygen to combat anoxia than to prevent carbonic acid acidosis due to atelectasis, mucous plugging, pulmonary edema, pneumonia, etc. The concentration of oxygen supplied to the patient in the respirator may be several times that of the air, but the regulation of carbonic acid concentration is determined by the total volume of gas exchange and by the conditions under which carbon dioxide may be transferred from the capillaries of the lung to the air in the alveolar spaces.

The frequency of occurrence of excessive hypopharyngeal and tracheal secretions, atelectasis, pulmonary edema and pneumonia is especially noteworthy. In those cases in which autopsy was performed, edema of the lungs was frequently noted, and the other conditions mentioned were observed hardly less often. The volume of tracheal secretions removed by suction was large in many cases—frequently two liters or more in 24 hours. In a few instances the quantity of sodium chloride lost by this route was measured and was found to be a very significant part of the total daily loss.

TABLE 4.—*Comparison of Chloride Losses in Tracheal Washings with Urinary Excretion*

		Tracheal Washings		Urinary Excretion	
Patient	Date	24 Hr. Volume cc.	Chloride Content as NaCl (grams)	24 Hr. Volume cc.	Chloride Content as NaCl (grams)
1.	9- 9-48	2260	1.93	1660	2.2
	9-10-48	1640	1.25	1175	0.51
			Died 9-11-48		
2.	9- 9-48	1420	.74	1950	0.80
	9-10-48	1660	1.06	2460	6.15
	9-11-48	1600	1.10	700	1.19
	9-12-48	2300	1.80	1020	1.32
	9-13-48	680	.50	1530	2.75

Examples of the extent of this loss and comparison of it with losses by urinary excretion are shown in Table 4.

To determine the primary cause of this lung edema was one objective of the study, and it is no doubt due, at least in part, to the extensive changes in the blood and protein pattern. As has already been reported in a separate phase of these studies[1]—beginning about the third day of illness, a major change in nitrogen metabolism occurs, manifested by a sharp drop in serum albumin, a gradual rise in the globulin fractions, and a large increase in urinary nitrogen.

The extent of the changes in albumin and globulin concentrations was such as to produce a ratio (albumin to globulin) of less than one in a number of cases, and in general paralleled the severity of the disease.

These plasma protein changes undoubtedly play a significant part in causing lung edema, and to the extent to which they can be prevented, the problem of respiratory acidosis is minimized.

If extensive paralysis occurs, the large increase in urinary nitrogen excretion is due mainly to destruction of muscle tissue. This is apparent also in the increased potassium excretion during this phase, since the intracellular mineral constituent is primarily potassium. If kidney failure does not occur, the findings may be a normal serum potassium level, combined with a negative potassium balance.

At a later stage, if recovery and tissue regeneration are present, the situation is reversed with a large positive nitrogen and potassium balance, and unless adequate potassium salts are supplied, low serum potassium values are to be anticipated.

Low serum potassium values at some stage of the disease were found in over half of the cases studied. The detailed relationships between serum potassium, urinary excretions, and the nitrogen balance will be presented in a separate report in process of preparation.

The significance of potassium deficiency in various conditions has recently received considerable attention, particularly in reports by Fenn,[5] Darrow[3, 4] and others.

The principal trends of alteration of electrolytes in the different phases are summarized diagrammatically in Charts 1 and 2, with explanatory comments in Table 5.

Summaries of laboratory findings in typical cases are shown in Tables 6 and 7 illustrative of the changes indicated in Charts 1 and 2.

From the experience gained in these studies, the

CHART 1 - MAJOR ELECTROLYTIC ALTERATIONS IN ACUTE HUMAN POLIOMYELITIS

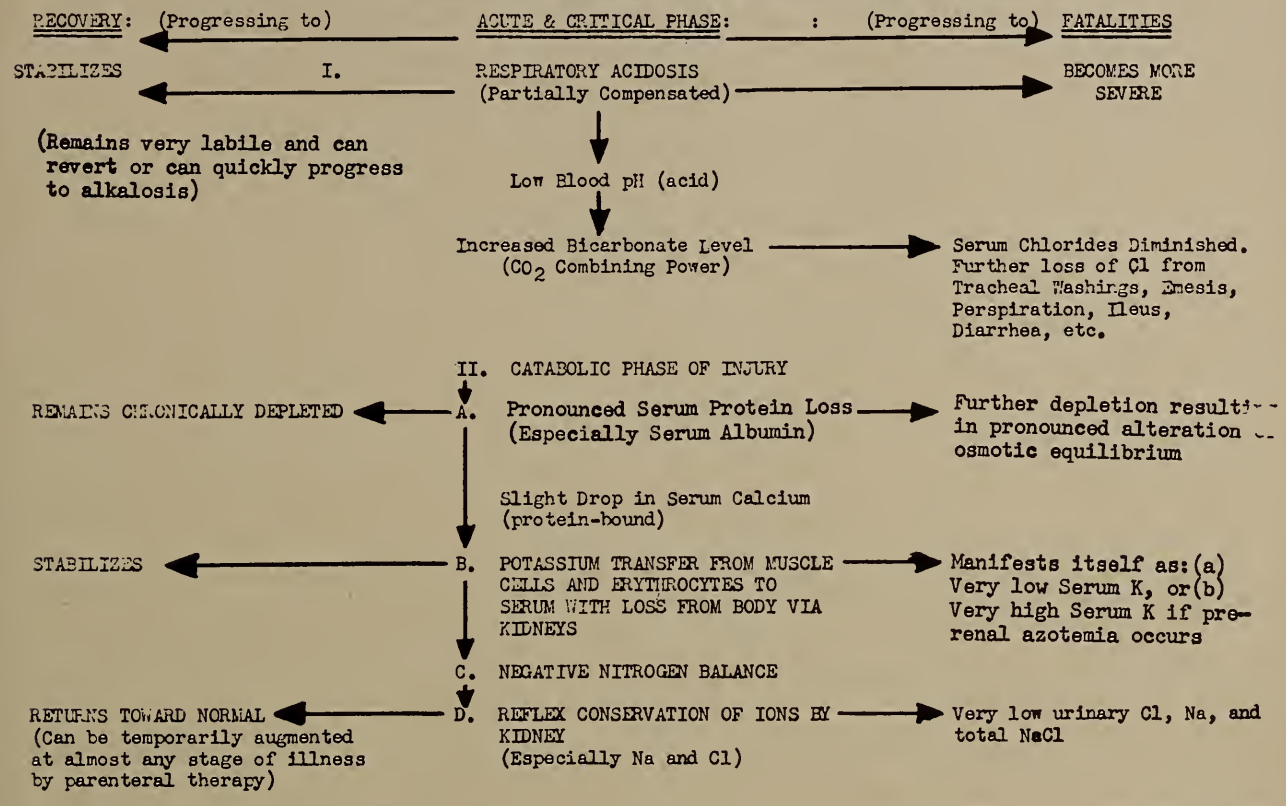
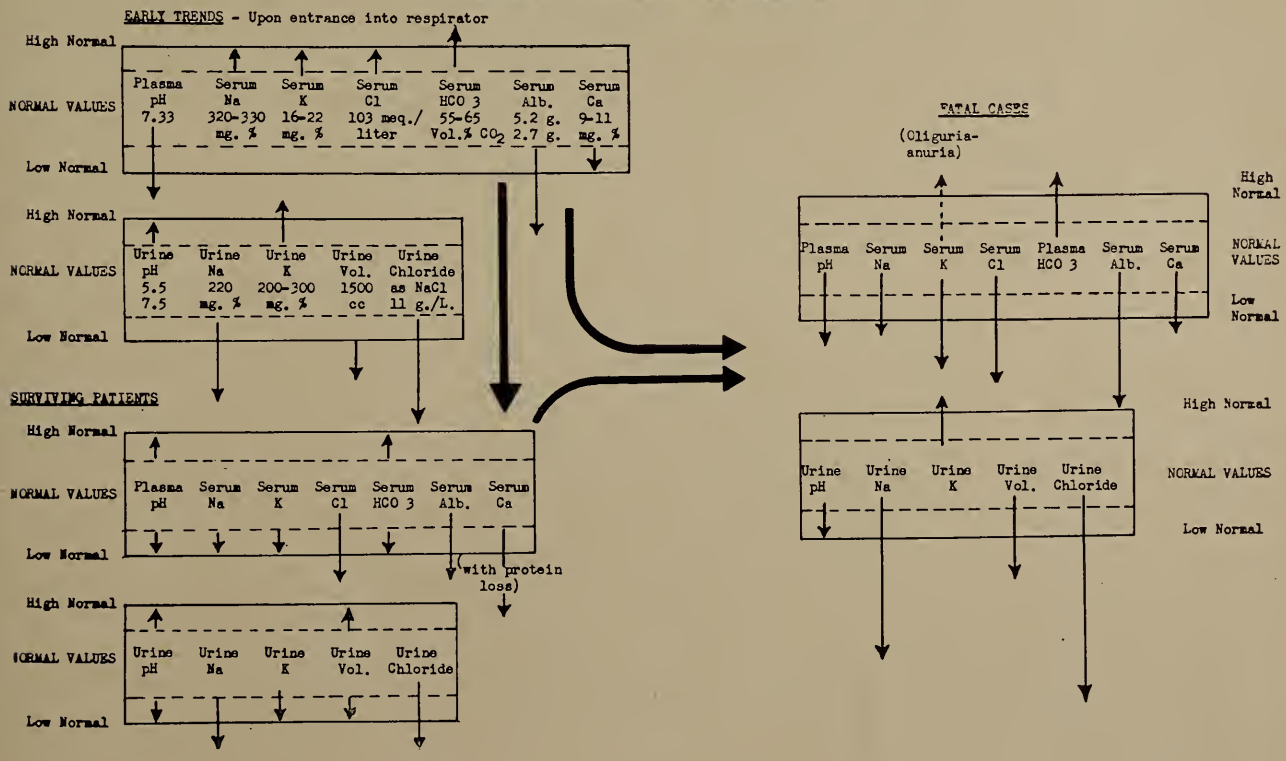


CHART 2 - ELECTROLYTE TRENDS IN ACUTE HUMAN POLIOMYELITIS
(Patients confined to Respirators)



following recommendations are made with respect to the usefulness of laboratory determinations.

1. For patients requiring a respirator, frequent determinations of plasma pH and bicarbonate should be performed. The necessity of anaerobic handling of the specimen and the effect of temperature on the measurement of pH should be noted in avoiding errors in pH measurements.

2. Plasma protein determinations, particularly of the albumin fraction, should be done at 24- to 48-

TABLE 5.—*Electrolyte and Other Changes in Acute Poliomyelitis: Probable Mechanisms, Explanations, Correlations*

SUBSTANCE OR REACTION	PROBABLE MECHANISMS, EXPLANATIONS, AND CORRELATIONS
1. Plasma pH	Initially, the majority of patients when placed into the respirator have partially compensated respiratory acidosis. This is correlated with the elevated blood bicarbonate. It is due to insufficient or incomplete pulmonary aeration which may be caused by atelectasis, pulmonary edema, obstruction to airways, or other causes. If the acidosis cannot be corrected, the patient soon dies. If the acidosis can be overcome, the blood pH appears to stabilize but the patient remains in a state wherein further acidosis or alkalosis ensues very easily in proportion to the mechanical factors governing respiration. Obstruction of the airway, atelectasis, pneumonia, etc., very readily throw the patient back into acidosis.
2. Plasma bicarbonate	Correlated directly to the blood pH and to the attempt of the body to maintain a normal pH.
3. Plasma chlorides	Initial values vary from a slight increase with dehydration to low-normal values when the patient is better hydrated. If the patient continues in respiratory acidosis, and the plasma bicarbonate increases, the chlorides drop rapidily to low levels. Much chloride is lost in the tracheal washings, in perspiration, in emesis, in diarrhea, and with ileus. Urinary chlorides are quite low.
4. Serum sodium	The initial values are within the upper limits of normal but fall to the range of low-normal with hydration. Subnormal values, when found, are not very low but range from 300 mg. per 100 cc. upward. Urinary excretion of sodium is very low consistently. Sodium conservation appears to be notable.
5. Serum potassium	The initial serum potassium values are in the high-normal range. With hydration, they may fall to definitely subnormal values. If the patient becomes oliguric or anuric, the serum potassium levels are very high, because of the prerenal azotemia and the inability of the kidney to excrete potassium. The excess potassium unquestionably is a manifestation of tissue destruction and movement of intracellular potassium to extracellular fluid. Early administration of parenteral fluids, especially glucose solutions, contributes heavily to the potassium shift. Because of inanition, dehydration, circulatory collapse, etc., it is a common practice to force parenteral fluids in large quantities. Clinically, when the potassium levels drop, the condition of the patient is the same as that of patients in diabetic coma: There is delirium, circulatory collapse, cyanosis, abdominal distention. When potassium salts are given by mouth, the delay before the appearance of potassium in the urine indicates the considerable deficit that had to be overcome. Urinary potassium is increased both relatively (to the sodium) and absolutely.
6. Serum albumin	There is a precipitous drop in total proteins, and especially in the serum albumin. This drop begins by the third day of illness and usually reaches its lowest level by the tenth day of illness. There has been no spontaneous tendency toward recovery noted in the severe cases. Actually, the globulins tend to rise, resulting in reversal of the albumin-globulin ratio. The phenomenon of the serum protein loss is dramatic, profound, and consistent. It is not associated with loss of albumin in the urine. It is the systemic manifestation of the catabolic phase of injury and may be a factor in the production of edema within the central nervous system.
7. Serum calcium	The initial values are within the range of low-normal. In the severe cases in which the patient lives, there is a slight drop from normal which is probably associated with loss of serum proteins and represents that portion of the calcium bound to protein.
8. Urinary pH	Variable, but generally in acid range.
9. Urinary sodium	Values are consistently very low. This remarkable sodium conservation continues until the patient is convalescent, but it can be altered toward normal with the parenteral administration of large volumes of saline solution. Whether the sodium conservation is associated with or correlated with the chloride loss, and consequent kidney conservation, is not known.
10. Urinary potassium	Consistently elevated. Although the blood serum potassium may give no clue, the urinary potassium level is high both absolutely and relatively to the urinary sodium. The withholding threshold of the kidney for potassium is very low. As no potassium was supplied exogenously in these studies, the excreted potassium must be derived from the erythrocytes and from muscle cells. It then finds its way into the serum and is excreted promptly via the kidney. The status of potassium deficit of the body can be evaluated by oral administration of potassium and successive serial urinary potassium determinations. Eventually, with correction of the deficit, excess potassium will be demonstrated in the urine.
11. Urinary volume	Proportional to the body hydration. Occasionally, oliguria or anuria will occur with a rise in the non-protein nitrogen level and with a rise in serum potassium. In that event the patient can live for only a short period unless urinary flow is reestablished quickly.
12. Urinary chloride	Generally decreased. The probable mechanisms are discussed under Item 9 in this table. Sodium is retained in the body. The chloride ion is also conserved by the kidney, especially since it is being lost through other portals—sweat, tracheal washings, emesis, diarrhea, ileus, etc.

hour intervals during the first ten days, and at less frequent intervals thereafter unless additional critical periods of illness occur which will cause further depletion of serum albumin.

3. A reasonably complete estimate of the relationships of the blood electrolytes may be obtained from the simultaneous determination of sodium, potassium, bicarbonate, chloride, protein, and pH values. The significance of abnormal findings will depend on the phase of the illness.

4. For replacement therapy, the daily determination of urinary sodium, potassium, and chloride output is of great assistance. Adequate urinary volume is very important.

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TABLE 6.—*Chemical Determinations in Fatal Cases*

	Blood/Serum Chemistry						Urine Chemistry				
Date	Chloride mEq. per Liter	Plasma Bicarbonate Vol. % CO_2	Na mg. per 100 cc.	K mg. per 100 cc.	Serum Protein Grams/ 100 cc.	pH at 38°C.	pH	Na mg. per 100 cc.	K mg. per 100 cc.	Chloride as (NaCl) gm. per Liter	Urinary Vol. 24 hr.
	Patient: White male, age 14 years. Entered hospital Sept. 9, 1948; entered respirator Sept. 10, 1948.										
9-14	102	52	320	10	4.98	....	(Partially compensated respiratory acidosis)				
9-16	86	79	295	20	....	7.05	Died Sept. 17, 1948				
	Patient: White female, aged 30 years. Entered hospital Sept. 12, 1948; entered respirator Sept. 15, 1948.										
9-15	110	51	325	13	6.37	7.29	....	107	180	....	....
9-20	96	69	330	19	5.93	7.19	....	....	....	....	....
9-21	95	58	....	....	5.34	7.15	5.8	....	....	....	Oliguria, cyanosis
9-21	98	94	330	28	5.13	7.26	Died Sept. 22, 1948				
	Patient: White male, age 38 years. Entered hospital Sept. 2, 1948; entered respirator Sept. 4, 1948.										
9- 9	93	73	345	18	4.82	7.07	....	....	....	1.3	1660 cc.
9-10	....	....	....	....	....	....	....	....	....	.45	1175 cc.
							Died Sept. 11, 1948. Due to massive pulmonary emboli				
	Patient: White male, age 33 years. Entered hospital Sept. 9, 1948; entered respirator Sept. 11, 1948.										
9-14	97	69	....	....	....	....	....	....	....	....	....
9-20	98	54	325	28	5.95	7.05	....	....	....	....	Anuria
9-21	88	31	....	....	5.61	7.05	N.P.N 300 mg. % (Metabolic acidosis). Died Sept. 21, 1948.				

TABLE 7.—*Summary of Laboratory Findings in a Typical Case*

Patient: White female, aged 32 years. Entered hospital Sept. 10, 1948; entered respirator Sept. 11, 1948.

	Blood/Serum Chemistry						Urine Chemistry				
Date	Chloride mEq. per Liter	Plasma Bicarbonate Vol. % CO_2	Na mg. per 100 cc.	K mg. per 100 cc.	Serum Protein Grams/ 100 cc.	pH at 38°C.	pH	Na mg. per 100 cc.	K mg. per 100 cc.	Chloride as (NaCl) gm. per Liter	Urinary Vol. 24 hr.
9-14	96	47	310	....	5.80	....	....	....	....	....	....
9-17	101	71	295	....	6.10	....	....	....	....	....	....
9-20	101	71	325	14	5.28	7.37	....	....	....	....	....
9-21	93	67	315	10	6.10	....	....	....	....	....	....
9-22	93	72	325	15	5.63	7.38	....	....	....	....	....
9-23	....	....	....	....	....	....	7.2	29	52	0.75	1070 cc.
9-24	84	83	330	16	5.18	7.30	5.8	81	248	0.73	?
9-27	100	55	300	15	A.-2.75 G.-3.45	7.40	7.3	....	....	....	1050 cc.
9-29	102	67	320	17	A.-2.93 G.-3.36	7.26	6.3	177	348	5.56	1050 cc.
10- 6	108	45	315	18	A.-3.11 G.-3.24	7.26	....	....	....	....	....
10- 8	100	88	310	18	A.-3.02 G.-2.32	7.32	....	....	....	....	....
10-11	99	85	310	16	A.-2.75 G.-2.92	7.41	....	....	....	....	....
10-13	97	78	315	20	A.-2.75 G.-3.07	7.29	6.7	53	161	2.02	1800 cc.
10-14	....	....	....	....	....	....	6.9	59	119	1.40	2650 cc.
10-18	106	70	....	....	....	7.38	....	....	....	....	....

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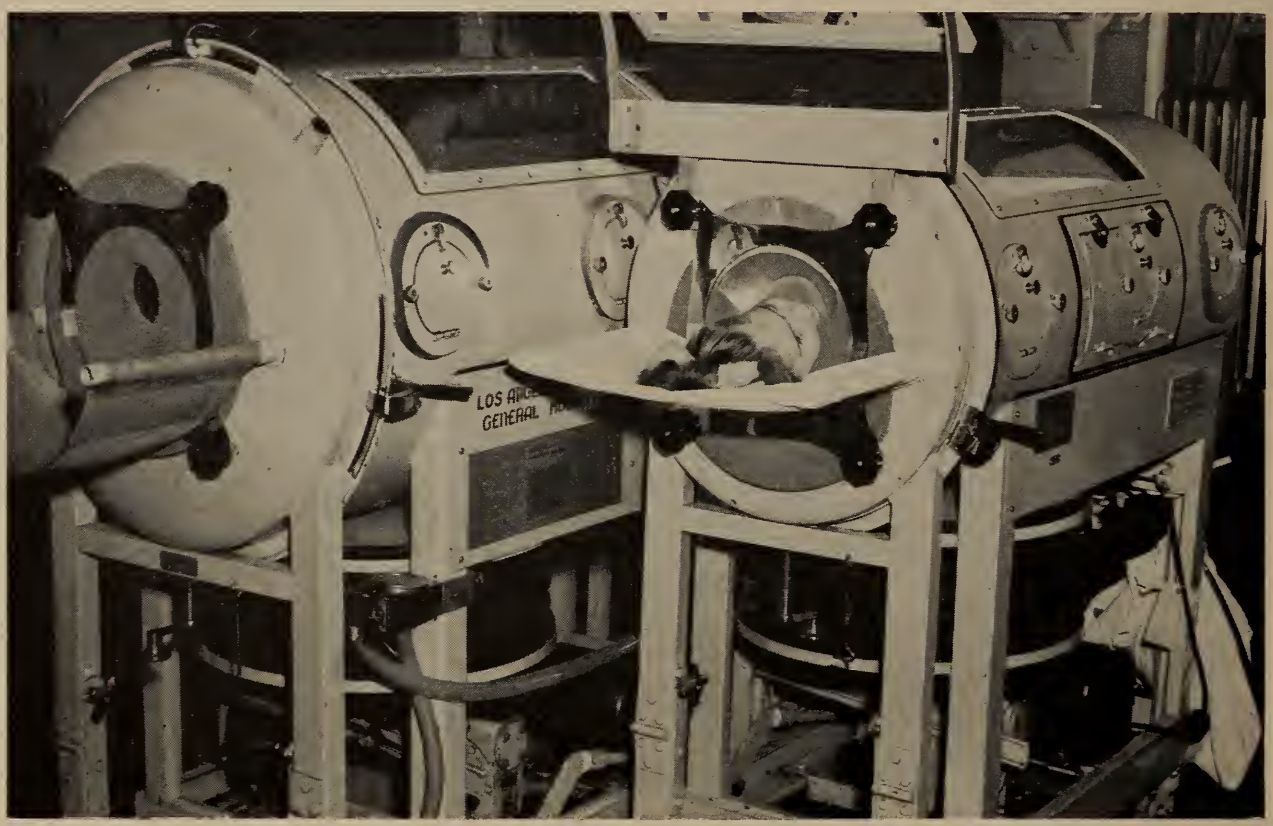
The New Junior Size Respirator



Despite the fact that three-fifths of all poliomyelitis cases occur in children under ten years of age, the various mechanical appurtenances devised to maintain respiration in patients requiring such assistance are designed for adults. The infant respirator is an exception, but very few infants contract the disease. Chest respirators come in all sizes, but at present they rarely furnish all factors required for the induction of maximum comfort and efficient respiration.

For these reasons, in 1948 the Drinker Collins Company was asked to manufacture a respirator for children between one and ten years of age. The machine produced is a replica of the adult model on a smaller scale. It has a larger motor and may be run at 50 cycles per minute. Otherwise it does not differ from larger ones, save in size. It has proven very satisfactory. Five of them were used throughout 1949 at the Los Angeles County General Hospital, and more are on order.

Likewise, a child's size rocking bed was made recently because the adult size is entirely unsuitable for children. It looks as though it might serve the purpose, but so far there has been no occasion to use it. The rocking bed has proven invaluable as an intermediate step in weaning adults from the respirator and returning them to the standard hospital bed when breathing has recovered sufficiently to permit it.

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Antihistaminic Drugs in Dermatology

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SUMMARY

From the results of treatment of 1,770 patients with dermatologic diseases (1,458 as reported in the literature and 312 observed by the author) it is concluded that antihistaminic preparations are of great value in allergic diseases where it is hypothecated that liberated histamine is the offender, as in acute edematous types of urticaria, erythema multiforme, and some cases of allergic pruritus.

The indiscriminate use of these drugs is to be avoided. Antihistaminic drugs are palliative—they do not cure. They often prolong the disease. They give temporary relief from swelling and pruritus. They develop no specific immunity and do not replace immunizing efforts. They do not replace or interfere with epinephrine or ephedrine.

THE present antihistaminic drugs are the outgrowth of the combination of many ideas and experiments. In 1910 Barger and Dale[2] isolated histamine from ergot and advanced the theory that the pharmacologic action of histamine on laboratory animals was similar to that noted clinically in anaphylactic shock. In 1932 Hill and Martin[10] presented a review of 165 experimental studies of nonspecific materials used to inhibit anaphylactic shock, none of which was considered sufficiently effective for therapeutic use. In 1927 the hypothesis that allergic reactions within tissue cells depend upon the liberation of a histamine-like substance was advanced by Lewis[13] in England. It was postulated that the union of antigen and antibody in sensitized cells results in the liberation of histamine normally present, which then produces an allergic response in all tissue by dilating the capillaries and causing a loss of plasma protein and fluid into the extracellular spaces. As this theory of the mechanism of allergic response gained acceptance, many investigators turned their efforts toward the development of a substance to neutralize, replace or displace histamine, thus short-circuiting the allergic reaction in the tissue cells.

The first preparation found to neutralize the effect of histamine both in living tissue and in the test tube was a phenolic ether, thymoxy-ethyldiethylamine (929 F), advanced by Fourneau and Bovet[6] in 1933.

In 1937 Bovet and Staub[22] advanced another formula, considerably more effective than thymoxyethyldiethylamine, known as n-phenyl-n-ethyl-n'-diethyl ethylene diamine 1571F. Unfortunately, both of these drugs were extremely toxic to human tissue and it was not until 1942 that Halpern[9] developed a substance which he called Antergan,® the chemical formula of which is dimethylaminoethyl benzyl analine. Antergan is unsuitable for general use in dermatology because it frequently produces undesirable reactions.

The first antihistaminic drug which was effective, yet non-toxic enough for general use was Benadryl® (betadimethylaminoethyl benzhydryl ether hydrochloride), reported by Loew[14] in February 1945.

The second histamine-neutralizing compound with relatively few side-reactions was Pyribenzamine® (n-pyridyl-n-benzyl-n-dimethylethylenediamine), reported by Mayer[16] in March 1945. This preparation appears to be about ten times as effective as Benadryl.®

The drugs in the approximate order of their effectiveness in relieving allergic symptoms are as follows:

1. Pyribenzamine®—n'pyridyl-n'-benzyl-n-dimethylethylenediamine monohydrochloride (Ciba Pharmaceutical Products, Inc.).
2. Benadryl®—beta-dimethylaminoethyl benzhydryl ether hydrochloride (Parke, Davis Company).
3. Trimeton®—1-Phenyl-1-(2 pyridyl) 3-dimethylaminopropane (Schering).
4. Hydryllin®—B-dimethylaminoethyl benzohydryl ether (Searle).
5. Thephorin®—2-methyl-9-phenyl-2, 3, 4, 9-tetrahydro-1-pyridindene hydrogen tartrate (Hoffmann-La Roche, Inc.).
6. Antistine®—2 phenylbenzylaminomethyl-imidazoline hydrochloride (Ciba Pharmaceutical Products, Inc.).
7. Neoantergan®—N-*P*-Methoxybenzyl-n'n-dimethylaminoethyl 2786 RP (Merck).
8. Antergan®—N'-dimethylamine ethyl N'-benzylaniline 2339 RP (Merck).

CRITERIA OF EFFECTIVENESS

Certain criteria now generally used to determine the effectiveness of an antihistaminic drug in laboratory animals give some measure of its effectiveness in man:

1. Its neutralizing effect of histamine on guinea pig intestine.
2. Ability to relieve histamine-induced asthma in guinea pigs.
3. Effect on anaphylactic shock.
4. Neutralizing effect of intravenous histamine and histamine artificially produced by horse serum in guinea pigs.
5. Prevention of wheals produced in rabbits by injection of histamine.
6. Toxicity quotient for animals such as dogs, rabbits, white mice and rats.
7. Effect on the blood and blood-forming mechanism.

However, the actual value of the drug in man must be determined by clinical use in a large group of patients with allergic disease, with attention to a few simple criteria:

1. Prompt alleviation of symptoms.
2. Recurrence of the symptoms upon withdrawal of the drug.
3. The substitution of a placebo for the drug should fail to elicit relief.
4. Patients should be under clinical control so that outside influences play no part in the response of the drug.
5. No other medication should be used in conjunction with the antihistaminic under investigation.

The position of antihistaminic drugs in dermatology cannot be determined without reporting all known data concerning their clinical effects. In this presentation the author's own experience (Table 1), as well as a review of the literature (Table 2) is presented. Table 2 shows the disease, the type of antihistaminic drug used, the number of cases reported, the investigator reporting, the results observed, and the percentage improvement obtained.

SIDE REACTIONS

Side reactions occur in 33 per cent of patients. No attempt will be made in this presentation to differentiate the specific reactions from each drug, as the responses vary widely; the same drug may

TABLE 1.—*Report of Cases by the Author*

Disease	Antihistaminic	No. of Cases	Results: Excellent	Fair	Negative
Acute urticaria	Benadryl®	17	10	5	2
Angioneurotic edema	Pyribenzamine®	34	25	7	2
	Trimeton®	19	14	3	2

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	17	15	88
Pyribenzamine	34	32	94
Trimeton	19	17	89
	70	64	91

Disease	Antihistaminic	No. of Cases	Excellent	Fair	Negative
Chronic urticaria	Benadryl	8	4	1	3
	Pyribenzamine	11	7	2	2
	Trimeton	7	5	....	2

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	8	5	63
Pyribenzamine	11	9	82
Trimeton	7	5	71
	26	19	73

Disease	Antihistaminic	No. of Cases	Excellent	Fair	Negative
Erythema multiforme	Benadryl	3	3	....	....
	Pyribenzamine	2	2	....	....

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	3	3	100
Pyribenzamine	2	2	100
	5	5	100

Disease	Antihistaminic	No. of Cases	Excellent	Fair	Negative
Atopic eczema (neurodermatitis)	Benadryl	82	27	31	24
	Pyribenzamine	22	9	8	5

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	82	58	71
Pyribenzamine	22	17	77
	104	75	72

Disease	Antihistaminic	No. of Cases	Excellent	Fair	Negative
Dermatitis venenata	Pyribenzamine	23	8	3	12

Summary	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	23	11	48

(Continued on next page)

Table 1 (continued)

Disease	Antihistaminic	No. of Cases	Excellent	Fair	Negative
Pruritus ani	Pyribenzamine	31	16	8	7
	Summary		Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine		31	24	77
		No. of Cases	Excellent	Fair	Negative
Infantile eczema	Benadryl	12	4	3	5
	Pyribenzamine	18	11	4	3
	Summary		Total Cases	Number Improved	Per Cent Improved
	Benadryl		12	7	58
	Pyribenzamine		18	15	83
			30	22	77
		No. of Cases	Excellent	Fair	Negative
Post-scabetic pruritus	Pyribenzamine	13	7	2	4
	Summary		Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine		13	9	69
		No. of Cases	Excellent	Fair	Negative
Dermatitis Herpetiformis	Pyribenzamine	5	....	2	3
	Summary		Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine		5	2	40
		No. of Cases	Excellent	Fair	Negative
Erythema induratum	Pyribenzamine	3	....	1	2
	Summary		Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine		3	1	33
		No. of Cases	Excellent	Fair	Negative
Pemphigus	Pyribenzamine	2	....	....	2
	Summary		Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine		2	0	....

produce stimulation in one patient and sedation in another. Apparently reactions vary with dosage as well as with individuals. Persistent use and variation of dosage will often relieve undesirable reaction. Prolonged use of the drug is not advisable without frequent medical supervision.

The main reactions are: Insomnia; drowsiness (50 to 60 per cent); fatigue, lethargy; dizziness; faintness, weakness; headache (10 to 15 per cent); stimulation; nausea (2 per cent), gastrointestinal disturbances; urinary frequency with cystitis (1 per cent); emesis; dryness of throat, and dermatitis medicamentosa. In dermatitis medicamentosa, the eruption appears as a fine, papulovesicular rash which is clinically indistinguishable from the rash of measles.

It is seldom necessary to completely discontinue the use of an antihistaminic because of side reactions. In cases in which reactions cause extreme discomfort to the patients, another type of antihistaminic drug can be substituted and when necessary several changes may be made in order to find an antihistaminic drug which will relieve the patient without producing an objectionable side reaction.

In many cases the side reaction of drowsiness is of definite benefit. Benadryl appears to give more sedation than any other antihistaminic drug. When insomnia or itching is present it is often advisable to use Pyribenzamine during the day and Benadryl at night.

DISCUSSION

Because angioneurotic edema and acute urticaria are manifested by an acute and sudden edema, they seem particularly susceptible to the replacing or displacing phenomenon attributed to the antihistaminic drugs. In 739 reported cases and in 70 cases in the author's experience, approximately 85 per cent of patients with acute urticarias responded well. Of 278 cases of chronic urticaria reviewed and 26 in the author's series, improvement was shown in 77 per cent. The results of therapy are extremely difficult to evaluate in a disease in which the cause is so variable.

The therapeutic usefulness of an antihistaminic drug may be judged by its effect in patients with chronic urticaria which has persisted for several months despite the use of all other known therapy. If recurrence results immediately after withdrawal of the drug, the possibility of direct histamine desensitization should be considered. As the antihista-

minic drug does not produce immunization, chronic urticarias with specific antibodies are often prolonged, allowing the clinician to fall into a false sense of security. The lack of response may be explained by several factors: Inadequacy of the compound, improper dosage, or too early cessation of treatment. On the other hand, the high incidence of response may be partially explained by spontaneous recovery or by recovery because of coincidental topical applications, rest, sedation, calcium or epinephrine compounds.

Pruritus ani and vulvae are usually caused by allergic reactions to chronic infection. Infectious, pathologic and neurotic factors must be eliminated before the antihistaminic drugs will be effective. Eliminating those cases which are primarily from dermatitis venenata as a result of enemas, douches or medication, the most common causes of pruritus vulvae and pruritus ani are bacterial, monilial or fungous infections. The constant and prolonged infection of the anus with bacteria or fungus produces maceration and eczematization which will eventually lead to a sensitization of the skin to the organism itself, or to the products of secretion, or the products of destruction of the organism. This phenomenon has been called allergy symptom complex to infection, the infection apparently setting up an epidermal hypersensitivity which manifests itself in the form of pruritus.

If the antihistaminic agent controls itching, the itching complex fixation might not develop and the condition of the skin would be improved because

TABLE 2.—*Review of Literature Including Cases Observed by the Author*

Disease	Antihistaminic	No. of Cases	Reported by	Results: Excellent	Fair	Negative
Acute urticaria	Benadryl®	15	O'Leary & Farber[18]	9	5	1
Angioneurotic edema	Benadryl	18	Curtis & Owens[4]	11	....	7
	Benadryl	10	Lynch[15]	9	1	....
	Benadryl	35	O'Leary & Farber	20	12	3
	Benadryl	62	Spain & Pflum[21]	54	....	8
	Benadryl	9	Morrow[17]	7	....	2
	Benadryl	17	Foster	10	5	2
	Pyribenzamine®	34	Osborne, Jordan, Rausch[19]	23	10	1
	Pyribenzamine	84	Arbesman[1]	79	....	5
	Pyribenzamine	12	Kesten[12]	11	1	....
	Pyribenzamine	403	Spain & Pflum	323	....	80
	Pyribenzamine	8	Morrow	7	....	1
	Pyribenzamine	34	Foster	25	7	2
	Hydryllin®	24	Spain & Pflum	12	....	12
	Trimeton®	4	Spain & Pflum	4	....	....
	Trimeton	19	Foster	14	3	2
	Thephorin®	7	Frank[7]	6	....	1
	Thephorin	2	Frank	1	....	1
	Antistine®	12	Hughes[11]	8	....	4

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	166	143	86
Pyribenzamine	575	486	85
Hydryllin	24	12	50
Trimeton	23	21	91
Thephorin	9	7	78
Antistine	12	8	67
	809	677	84

				Excellent	Fair	Negative
Chronic urticaria	Benadryl	35	O'Leary & Farber	25	7	3
	Benadryl	8	Shaffer[20]	7	....	1
	Benadryl	7	Curtis & Owens	3	....	4
	Benadryl	10	Lynch	8	2	....
	Benadryl	13	Lynch	11	....	2
	Benadryl	75	O'Leary & Farber	48	17	10
	Benadryl	8	Foster	4	1	3
	Pyribenzamine	15	Osborne, Jordan, Rausch	9	....	6
	Pyribenzamine	115	Arbesman	78	....	37
	Pyribenzamine	11	Foster	7	2	2
	Trimeton	7	Foster	5	....	2

Summary	Total Cases	Number Improved	Per Cent Improved
Benadryl	156	133	85
Pyribenzamine	141	96	68
Trimeton	7	5	71
	304	234	77

(Continued on next page)

the trauma of scratching would be removed. The author[5] reported the interrelated action of pruritus ani, seborrheic dermatitis and dermatophytosis in a previous paper.

In 74 cases of atopic eczema from the literature and 104 observed by the author, 60 per cent of the patients showed improvement after antihistamine therapy. In a few instances the eruption cleared and the patients were symptom free; however, in the majority the improvement consisted only of the control of itching. Because of the lack of uniformity of procedure among the various investigators, the only definite conclusion is that the various antihistaminic agents control pruritus when given in proper doses, thereby allowing other standard therapy an opportunity to clear the clinical manifestations of the disease.

In 119 reported cases of dermatitis venenata of all types, approximately 54 per cent of the patients obtained relief from itching but no change in the clinical appearance of the dermatitis.

There are available at present drugs which experimentally have antihistaminic and prophylactic usefulness as well as palliative action against skin manifestations of allergic disease. The relief of itching and the sedation help to control the patient and thereby increase the effectiveness of the normal therapeutic measures. The experimental work to date indicates that the antagonists of histamine in no way interfere with the antigen-antibody reaction and must not be confused with desensitization.

The antihistaminic drugs and histamine enter into a competitive relationship in that they compete for the site of action normally involving histamine, whether it be in a muscle cell, glandular cell or other type of cell. This may be called competitive inhibition. The antihistaminic agents undoubtedly act better when employed prophylactically than when employed therapeutically or correctively. The author has observed that in many instances the patient has been temporarily relieved by the drug but the interference with the immunity-creating mech-

TABLE 2 (continued)

Disease	Antihistaminic	No. of Cases	Reported by	Excellent	Fair	Negative
Erythema multiforme	Benadryl	4	Lynch	1	2	1
	Benadryl	3	Foster	3	....	....
	Pyribenzamine	2	Foster	2	....	....

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Benadryl	7	6	86
Pyribenzamine	2	2	100
	9	8	90

Disease	Antihistaminic	No. of Cases	Reported by	Excellent	Fair	Negative
Atopic eczema (neurodermatitis)	Benadryl	12	Morrow	4	6	2
	Benadryl	82	Foster	27	31	24
	Pyribenzamine	16	Osborne, Jordan, Rausch	8	1	7
	Pyribenzamine	21	Arbesman	12	....	9
	Pyribenzamine	20	Morrow	4	14	2
	Pyribenzamine	22	Foster	9	8	5
	Thephorin	5	Frank	3	....	2

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Benadryl	94	68	72
Pyribenzamine	79	56	71
Thephorin	5	3	60
	178	127	71

Disease	Antihistaminic	No. of Cases	Reported by	Excellent	Fair	Negative
Dermatitis venenata	Benadryl	4	Morrow	2	....	2
	Pyribenzamine	15	Osborne, Jordan, Rausch	....	....	15
	Pyribenzamine	20	Arbesman	6	....	14
	Pyribenzamine	16	Kesten	10	....	6
	Pyribenzamine	33	Morrow	29	....	4
	Pyribenzamine	23	Foster	8	3	12
	Thephorin	4	Frank	2	....	2
	Antistine	4	Hughes	4	....	....

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Benadryl	4	2	50
Pyribenzamine	107	56	52
Thephorin	4	2	50
Antistine	4	4	100
	119	64	54

(Continued on next page)

TABLE 2 (continued)

Disease	Antihistaminic	No. of Cases	Reported by	Excellent	Fair	Negative
Dermographism	Pyribenzamine	4	Kesten	3	1	....
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine			4	4	100
				Excellent	Fair	Negative
Pruritus ani	Benadryl	9	Lynch	6	3	....
	Benadryl	8	Morrow	5	....	3
	Pyribenzamine	90	Frankfeldt[8]	57	....	33
	Pyribenzamine	4	Arbesman	3	....	1
	Pyribenzamine	15	Kesten	10	5	....
	Pyribenzamine	17	Morrow	3	10	4
	Pyribenzamine	31	Foster	16	8	7
	Antistine	5	Hughes	5	....	....
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Benadryl			17	14	82
	Pyribenzamine			157	112	71
	Antistine			5	5	100
				179	131	73
				Excellent	Fair	Negative
Physical allergies (heat, cold, sunlight)	Pyribenzamine	6	Kesten	5	....	1
	Pyribenzamine	2	Osborne, Jordan, Rausch	2	....	....
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine			8	7	88
				Excellent	Fair	Negative
Infantile eczema	Benadryl	12	Foster	4	3	5
	Pyribenzamine	7	Arbesman	4	....	3
	Pyribenzamine	18	Foster	11	4	3
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Benadryl			12	7	58
	Pyribenzamine			25	19	76
				37	26	70
				Excellent	Fair	Negative
Serum sickness reactions	Pyribenzamine	8	Kesten	6	2	....
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine			8	8	100
				Excellent	Fair	Negative
Insect bites	Benadryl	11	Lynch	4	4	3
	Pyribenzamine	1	Osborne, Jordan, Rausch	1	....	....
	Pyribenzamine	2	Arbesman	2	....	....
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Benadryl			11	8	73
	Pyribenzamine			3	3	100
				14	11	79
				Excellent	Fair	Negative
Dermatitis medicamentosa	Pyribenzamine	10	Morrow	4	4	2
	Benadryl	2	Morrow	1	....	1
	SUMMARY			Total Cases	Number Improved	Per Cent Improved
	Pyribenzamine			10	8	80
	Benadryl			2	1	50
				12	9	75

(Continued on next page)

TABLE 2 (continued)

Disease	Antihistaminic	No. of Cases	Reported by	Excellent	Fair	Negative
Nummular eczema	Pyribenzamine	12	Morrow	3	7	2
	Benadryl	1	Morrow	....	1	....

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	12	10	83
Benadryl	1	1	100
	13	11	85

				Excellent	Fair	Negative
Post-scabetic pruritus	Pyribenzamine	12	Morrow	6	6	....
	Pyribenzamine	13	Foster	7	2	4
	Benadryl	7	Morrow	2	4	1

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	25	21	84
Benadryl	7	6	85
	32	27	84

				Excellent	Fair	Negative
Statis dermatitis with absorption phenomena	Pyribenzamine	12	Morrow	1	7	4
	Benadryl	5	Morrow	1	3	1

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Benadryl	5	4	80
Pyribenzamine	12	8	67
	17	12	71

				Excellent	Fair	Negative
Dermatitis herpetiformis	Pyribenzamine	4	Morrow	....	1	3
	Pyribenzamine	4	Osborne, Jordan, Rausch	3	....	1
	Pyribenzamine	5	Foster	....	2	3
	Benadryl	2	Morrow	....	1	1

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	13	6	46
Benadryl	2	1	50
	15	7	47

				Excellent	Fair	Negative
Seborrhea	Pyribenzamine	4	Morrow	4	....	....
	Benadryl	3	Morrow	....	2	1

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	4	4	100
Benadryl	3	2	67
	7	6	86

				Excellent	Fair	Negative
Erythema induratum	Pyribenzamine	3	Foster	....	1	2

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	3	1	33

				Excellent	Fair	Negative
Pemphigus	Pyribenzamine	2	Foster	....	....	2

SUMMARY	Total Cases	Number Improved	Per Cent Improved
Pyribenzamine	2	0	....

anism of the body has to some extent prolonged the course of the disease. It is generally admitted that the present antihistaminic drugs are not altogether ideal, as they are not effective in allergic manifestations of all types, nor are they universally useful in any particular syndrome.

Caution and infinite patience must be exercised in the evaluation of the clinical response to any drug —caution because of the tendency of the clinician to interpret results according to a predetermined purpose, and patience because no two people respond in like manner either physiologically or mentally. The subjective response varies with environmental, educational, racial and physical abnormalities of the patient. The role of histamine in the production of allergic responses varies with each patient as well as with the shock center involved.

The use of the antihistaminic drugs does not alleviate the necessity for thoroughness in investigation or the use of fundamental knowledge of the care of allergic dermatoses.

It would seem that the various antihistaminics give their best results when used to relieve allergic pruritus, and for this reason alone they fill a specific need in the dermatologic armamentarium.

The author's experience with the antihistaminics in the form of an ointment or cream has been so lacking in relief of symptoms that he has discontinued their use in that form.

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Asthma in Children—Problems in Diagnosis

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SUMMARY

Bronchial asthma in children may be difficult to diagnose. Education of the parents regarding allergic conditions, specifically bronchial asthma, is exceedingly important in order to assure satisfactory treatment and clinical results.

Chest symptoms of unexplained origin in early life should immediately arouse suspicion of allergic disease. Other causes of asthmatic symptoms must be borne in mind and excluded before a positive diagnosis of bronchial asthma is established.

Of the many factors to be considered in investigating a child with asthma, a comprehensive history is most essential. The climate to which the patient is exposed and the psychic influences must be taken into account. Physical examination, x-ray films and laboratory procedures should be carefully executed. Skin testing, especially with food allergens, should not be relied upon to give all the information in allergic disease. Some form of diet trial, such as elimination diets, should be used if sensitivity to food is suspected.

A HISTORY of allergic disease during childhood is found in 50 per cent of adults who have bronchial asthma. During childhood, bronchial asthma is the most frequent of the various manifestations of allergic sensitivity. Thus it is evident that the problems involved in diagnosing asthma in children are of primary importance.[13]

The onset of asthma in small children does not always follow the pattern typically seen in older individuals and for this reason it is undoubtedly overlooked in many cases. A definite diagnosis may be in doubt for a considerable length of time and through several attacks. It must be established by eliminating the various other conditions that may cause wheezing and dyspnea. Once the diagnosis has been made, many physicians tend to minimize the condition to the parents in the hope that the disease will not recur and that as the patient grows older he will cease to have asthma. It has been proved that the earlier an allergic state is recognized the easier it is to control and, if properly treated, the less liable it is to be a problem in later life.

The treatment of asthma in children is a somewhat different problem than that encountered in adults. In the first few years of life, the symptoms and physical findings are completely objective. It is the family rather than the patient who must be convinced of the need for therapy. Often there have been signs of other allergic manifestations, such as eczema or nasal allergic disease, which have conditioned and prepared the family for the diagnosis of bronchial asthma. The physician who makes the original diagnosis must satisfy the family that the illness is actually an allergic problem and that bronchial asthma is not just a cold, bronchitis or croup.

Several attacks, possibly of increasing severity, may have to occur before the family is convinced. After the diagnosis has been established the question of cause arises, and the all-important problem of educating the parents regarding allergic diseases begins. They should be told that asthma tends to recur and particularly that it is rarely cured but can be controlled. It is essential that they recognize that the disease will demand prolonged observation and therapy and that specific treatment of bronchial asthma in childhood is of definite value. If the treatment of all children with asthma were considered a perennial problem, the results of therapy would be greatly enhanced. In this respect, the experience of most allergists is in agreement with the conclusions drawn by Flensborg[4] in Denmark. According to Flensborg's study, children not receiving specific therapy were more prone to repeated attacks of bronchial asthma and other allergic manifestations than those who were specifically treated.

The tendency to wait to see if the child will outgrow the allergic state is born of wishful thinking and is not based on sound clinical observation. In one series,[2] asthma developed in 50 per cent of eczematous children. This observation spotlights the fallacy of the common saying, "Don't worry, Mother, the baby will outgrow his eczema."

Asthma becomes a significant problem in children before the age of five years. The average age of onset is between two and four years. It occurs more frequently in boys than in girls. The classical sequence is colic, starting most commonly about the age of three weeks; atopic dermatitis (infantile dermatitis) starting a few weeks later; recurrent upper respiratory infections, starting between the ages of two and three years, followed by the development of pollenosis or perennial allergic rhinitis and finally bronchial asthma.[6] Chest symptoms of unexplained origin in early life should immediately arouse suspicion of allergic disease.[7] During this period allergic edema rather than smooth muscle spasm is dominant; the spastic element does not develop char-

acteristically until the child grows older. At times noisy breathing and loud rales are the only signs of the condition. Bronchial asthma may not be indicated by physical findings present at the time of examination. The diagnosis must be made by means of history, skin testing and laboratory studies.

SYMPTOMS

The symptoms of bronchial asthma in children differ from those in adults as follows: (a) Asthma in children may only cause dyspnea or rapid breathing; (b) the asthmatic infant may appear comfortable, even when lying flat on his back. The absence of orthopnea can cast doubt on the diagnosis of asthma; (c) the absence of anxiety in the infant is particularly noticeable when compared to the feeling of apprehension common in the adult.

TYPES OF ASTHMA

Bronchial asthma in children is of two types, paroxysmal and chronic. The symptoms of both types are varied degrees of wheezing, dyspnea and coughing. The clinical course in the paroxysmal group largely depends on the efficiency and success of treatment. Chronic asthma, the condition which is most wearing for the patient and his family, is extremely difficult to control and treat satisfactorily.

The most common complications of long continued bronchial asthma in the child are emphysema and a typical chest deformity.[1] Because of its resemblance to that caused by rickets, this deformity is termed asthmatic pseudorickets. Bronchiectasis[17] also may prove a complicating factor.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of bronchial asthma is important. The many other causes of wheezing, dyspnea and coughing which must be kept in mind are as follows:

1. *Asthmatic bronchitis* in children is characterized by coryza, fever and poor response to ephedrine and epinephrine. There is a predominance of eosinophils in nasal smears and an accelerated blood sedimentation rate. It may be followed by bronchial asthma. Fever may be present with bronchial asthma alone, but may also arise from secondary infection or from allergic reaction, especially to foods.

2. *Foreign bodies in the bronchus* sometimes may cause wheezing, coughing, or shortness of breath. X-ray, fluoroscopic and bronchoscopic examinations are mandatory when an obstruction is suspected.

3. *Pulmonary conditions arising from cystic fibrosis of the pancreas* do not respond to ephedrine or epinephrine. Poor absorption of vitamin A as indicated by vitamin A tolerance tests, diminution or absence of the pancreatic enzymes on duodenal drainage, and the finding of a high fat content in the stools make the differential diagnosis.

4. *Thymic asthma* is rare. Enlargement of the thymus gland is immediately evident in x-ray films of the chest, and the condition responds rapidly to roentgen therapy.

5. *Dust bronchitis,* which has been noted in the dust-bowl area of the Middle West, is due to inhalation of finely pulverized dust. The resultant coughing is explosive and intractable. Fever and wheezing may be associated with soft, patchy mottling of the lungs in x-ray films.

6. *Sighing dyspnea* due to hyperventilation is a functional disorder which may occur in older children. Physical examination shows no abnormalities. The chief complaint is the difficulty of getting a deep breath. The condition is not helped with epinephrine.

7. The possibility of mistaking *pertussis* for bronchial asthma must be remembered. Pertussis is characterized by a lack of response to ephedrine or epinephrine, an absence of eosinophils in the blood, by leukocytosis with relative lymphocytosis, and by growth of *H. pertussis* on culture.

8. *Bronchotetany* is rare but may cause dyspnea and wheezing. Intravenous injections of calcium relieve the symptoms.

9. *Cardiac asthma* rarely occurs in infancy or childhood. (White's[18] youngest patient was 18 years of age.)

10. *Lymphadenopathy and mediastinal tumors, including Hodgkin's disease,* may result in compression and constriction of some part of the respiratory tract, causing wheezing and coughing.

11. *Allergic bronchopneumonia or Loeffler's syndrome* may cause transitory infiltrations of the lungs which can be revealed by x-ray examinations of the chest. A very high blood eosinophilia usually accompanies this condition. Miller and Piness[12] reported a series of cases of such allergic bronchopneumonia.

12. Frequently, mild (sometimes even severe) bronchial asthma in childhood is confused with pseudo-bronchopneumonia, infectious bronchitis or croup. On the other hand, actual pneumonia must be recognized and may be superimposed upon allergic bronchitis or bronchial asthma.

INVESTIGATION

There are many factors that must be considered in making a diagnosis of bronchial asthma in a child. A physician has the responsibility of reviewing the condition of the patient not only from a laboratory standpoint but as a whole. To accomplish this, the following factors should be taken into account:

History: It is hardly necessary to stress the great importance of obtaining a detailed history — one which includes data on psychological and environmental influences and the various other allergic manifestations as well as the family background. A detailed dietary history is of the utmost significance. This record should reveal dislikes or disagreements for specific foods and any possible imbalance of diet. A careful study of environmental and occupational surroundings also is essential when inhalants are suspected. Several conferences with the

parents may be necessary, as many details are not remembered on the first visit.

Effect of climate: Temperature, humidity, altitude and seasons have varying effects on bronchial asthma, especially when rapid climate changes occur. Schutzbank[16] recently found that 72 per cent of a series of patients with allergic disorders were benefited by living in Tucson, Arizona. The beneficial effects of inland, dry areas on allergic disease caused by foods, as well as decrease or abatement of the condition in the summer, as reported by Rowe,[14] has been confirmed in the author's experience. The explanation of these geographic influences is obscure. The benefit of summer weather probably depends on the sun's radiation.

Psychosomatic factors: The psychic aspects of asthma in children are difficult to evaluate. A majority of the behavior problems of the asthmatic child can be explained on a physical basis,[5] although this is not invariably true. Therefore, treatment of the psychic problem may be as significant as the program of hyposensitization or any other therapy. For example, some children, in order to gain attention, will dominate the home or schoolroom by actually precipitating or simulating acute cough, wheezing or asthmatic attack. Whether these children have an actual attack of asthma is difficult to establish. Control of the psychic influences may make the difference between good and poor control of an asthmatic child. For this reason, the exact influence of psychic problems must be evaluated for each patient and an endeavor made to rectify any contributory condition. Every attempt should be made to allow the child to lead as normal a life as possible and to make him feel that he is secure. This should be particularly reflected in the parents' attitude. Henderson[8] wisely suggested that "healthy neglect may even be preferable to over-solicitude."

Physical examination: Physical examination must be such as to uncover not only bronchial asthma but other manifestations of allergic reaction. The child should be carefully scrutinized for evidence of focal infections and other diseases. An x-ray examination of the chest, and, in older children, of the sinuses, should be routine. It must be remembered, however, that between attacks of asthma, there may be no abnormality observed in examination of the lungs.

Laboratory procedures such as examination of nasal smears and differential count of blood cells may be of some help in establishing the diagnosis.

Skin testing: The knowledge gained from skin testing is secondary in importance to that obtained from a detailed history. In the author's opinion, however, information can be gained from skin testing that could not possibly be elicited in any other way. Opinions differ regarding the number of tests which should be done. In recent "Letters of the International Correspondence Society of Allergy,"[11] the question was asked, "How many and what type of skin tests do you consider essential in a case of bronchial asthma?" The opinions ranged from doing nearly no tests at all to the extreme of making several hundred tests. The method of skin testing also varied.

There is also a question as to the value of skin tests in very young children. Skin reactions are much less likely to be evident in the first two years of life. Some physicians believe that skin testing is of no value in the first year of life. The author believes it often gives some clue to skin test infants in the first two years of life for reaction to the foods they have in their limited diets and for reaction to inhalants they may encounter. The method used is to screen the patient with scratch tests for response to the allergens felt to be important for the child. If the patient does not respond to the scratch tests, intradermal tests are rarely used for patients less than six years of age, and then for only the very important inhalant allergens. The information gleaned from tests with foods is by no means as reliable as that with inhalants. Moreover, there are children who are definitely sensitive to inhalants, and especially to foods, who do not have reaction to skin tests. The number of allergens with which a child is tested should increase as his age increases. Passive transfer tests may at times be indicated. Ophthalmic and nasal membrane tests have little value in determining the cause of allergic disease in children. The size of the reaction to skin testing has no bearing on the importance that the allergen causing the reaction may play in the child's condition.

FOODS

The problem of allergic sensitivity to foods in children is of paramount importance. The fact that foods can cause asthma in children cannot be disputed.[10] There is considerable difference of opinion as to the frequency of this sensitivity and its relative importance to recurrent respiratory infections, sensitization to pollens and other environmental allergens. Certainly, during the first few years of life, food sensitivities play a major role as a cause of allergic bronchial disease. A history of colic, vomiting and diarrhea, or of many changes in the food formula in early life, suggests the possibility of food sensitivity. Because of the limited number of foods in the diet in infancy, the study of possible allergenic foods is not difficult. Soya milk and the strained meat formulae offer complete substitutes for cow's milk. Potato and tapioca can be used in place of cereal. Many vegetables and fruits can be utilized. Thus, with processed foods, food substitutes and synthetic vitamins, nutrition and weight can be amply protected. Our experience confirms the reported frequency of allergic reaction to milk, eggs and the cereals, along with other less commonly offending foods such as fish, chocolate, citrus fruits, bananas and apples.

Here again, there is a difference of opinion. Hill[9] feels that asthma is rarely caused by allergic sensitivity to food. Cook[3] expressed the opinion that no more than 20 per cent of the cases of asthma in children are due to food. The author's experience leads to the belief that sensitivity to food plays the

chief role in bronchial asthma during the first five or six years of life.

Hill[10] recently discussed the danger inherent in test-negative diets. A five-year-old girl was brought to him with a typewritten list of "good" foods typed in black, and "bad" foods typed in red. The classification had been determined by skin tests. Tests had been done with 236 foods, including squab, tripe, calf brain, venison, caviar, poppyseed, elderberry, pheasant, chives and Limburger cheese. The child had had reaction to 109 of them, including Sanka coffee, rutabaga, German celery, thyme, cranberry, sand-dabs, tripe, sweetbreads and watercress. Among the foods she was allowed to eat were pheasant, guinea-hen, venison, horsemeat, turtle, abalone, caraway seed, juniper, avocado, mango and quince. This shows how far afield test-negative diets can go.

To determine the exact influence of any one food upon an asthmatic state is not easy, because of the many complicating and contributing factors involved. There is a great variance of tolerance to food at various times of life. The mother of a child with allergic disease may know some of the foods that produce asthma and often may have omitted them from the child's diet before skin tests were done.

Diet trial has a definite place in evaluating allergic response to foods. Because of the inadequacy of skin testing, some kind of diet trial must be used. Elimination diets such as those outlined by Rowe[15] are of definite help, particularly if they are modified as indicated by the history and skin testing of the patient. Such diets eliminate the most common offending foods and establish a definite program with detailed menus and recipes. If the mother is instructed carefully and the diet is followed in detail, nutrition and weight are well protected.

INHALANTS

In infancy and early childhood inhalants play a less important role than do food allergens. Inhalants become more important as age increases. Most of the children who react to pollen also react to house dust.

BACTERIAL ALLERGY

True bronchial asthma due to sensitivity to bacteria is rare in children. However, infections of any type may activate or increase allergic manifestations. Therefore, eradication and control of infections is required for the benefit on the allergic state and also for the child's general health.

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Anticoagulant Therapy in Heart Disease

A Summary of the Literature

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SUMMARY

Considerable experience by many independent workers with the use of anticoagulants in the treatment of certain types of heart disease has shown that such therapy reduces significantly the incidence of thromboembolic complications and, largely through this effect, the morbidity and mortality rate from heart disease of these types.

This is certainly established in acute coronary occlusion with myocardial infarction and in those instances of rheumatic heart disease with auricular fibrillation in which repeated embolic phenomena have occurred. The case for the administration of the anticoagulants in congestive heart failure is less secure, although there is no doubt that the number of thromboembolic complications is reduced by use of them.

The administration of the anticoagulants requires considerably more exacting attention than does the administration of the majority of therapeutic agents in use commonly today. Hence, it is suggested that the use of anticoagulants in heart disease be restricted to those instances in which the indications are clear and facilities are compatible with the efficient and safe use of the drug, whether Dicumarol or heparin.

THE use of the anticoagulants in the prevention and treatment of thromboembolic phenomena clinically is well established.[1,10,11,13,15,18,38] Hines and Barker[10] assert that "anticoagulant therapy is the best method for preventing thrombosis and embolism which is available at present." They list the following situations in which the use of anticoagulants may be advisable in chronic cardiovascular diseases:

A. Treatment of single episodes of thrombosis, or embolism.

1. Acute arterial occlusion (including coronary artery occlusion).
2. Acute thrombophlebitis, or phlebothrombosis.
3. Pulmonary embolism, or infarction.

B. Prevention of recurring episodes of thrombosis.

C. Long-term treatment of the disease (only in certain situations).

This summary is confined arbitrarily to the use of the anticoagulants in heart disease and omits reference to use of them in diseases involving primarily the vascular system outside the heart.

ANTICOAGULANT THERAPY IN ACUTE CORONARY OCCLUSION WITH MYOCARDIAL INFARCTION

The use of anticoagulants in the prevention and treatment of coronary thrombosis with myocardial infarction was suggested by Best and co-workers in a report on a series of animal experiments on intravascular clotting. These investigators produced intravascular clots in systemic veins by both mechanical and chemical methods. They demonstrated that the incidence of such artificially produced intravascular clots could be reduced dramatically by the use of heparin.

In 1938, Solandt and Best[29] produced coronary thrombosis regularly in experimental animals by injecting a solution of sodium ricinoleate into an isolated coronary artery. A thrombus formed in almost every instance when no heparin was used. When the animals were heparinized prior to the injection of ricinoleate, thrombus formation was a rare occurrence.

Solandt, Nassim and Best[30] produced large mural thrombi in the left ventricles of experimental animals by ligating the anterior descending branch of the left coronary artery and injecting sodium ricinoleate into the subendocardial myocardium. A large mural thrombus formed promptly and consistently when the animals were not heparinized. When heparin was given well before the experiment, no mural thrombi formed.

Heparin or Dicumarol* was used clinically in individual cases, or in small series of cases of coronary occlusion with myocardial infarction during 1941 and 1942. The first American report concerned exclusively with the use of Dicumarol in acute coronary occlusion appeared in December 1945 when Wright[34] described experience with 76 patients. Between the time of that report and 1949, approximately two dozen series of cases were reported in the American literature. As reflected in the literature, the greatest experience with this means of therapy was obtained by Peters and Brambel[26,27] in Baltimore, by Nichol[19,20,23] in Miami, by Parker and Barker[24,25] at the Mayo Clinic, and by Wright and his associates[35,36,37,39,40] in New York City.

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*Dicumarol is the registered collective trademark of the Wisconsin Alumni Research Foundation which controls the use thereof.

The results obtained, while consistently favorable, were in no instance based upon a sufficient number of cases, nor upon sufficiently well controlled case material to warrant statistical analysis. They did, however, justify the more extensive study carried out by the American Heart Association's committee for the evaluation of the anticoagulants in the treatment of coronary occlusion with myocardial infarction.

THE AMERICAN HEART ASSOCIATION STUDY

Members of this committee, associated with the 16 hospitals in which the patients included in the study were treated, observed over 1,000 cases of coronary occlusion with myocardial infarction. Somewhat fewer than half of the patients were treated by conventional methods alone. The others received anticoagulants as well. A record of each case was forwarded on master forms to the central office at the New York Hospital where it was studied and the data tabulated for intensive statistical analysis.

A definitive report on the 1,031 case reports accepted for analysis is being prepared and will be published as a monograph. The data and conclusions quoted here are those contained in the preliminary report of the committee based upon a gross analysis of the first 800 cases collected.[39, 40] Comparable figures based upon the total 1,031 cases are known to be not significantly different and to support the same conclusions.

Twenty-four per cent of the control group and 15 per cent of the anticoagulant-treated patients died during the six-week period of observation. Deaths following one or more thromboembolic complications occurred in roughly 10 per cent of the control group and in 3 per cent of the treated patients. Deaths not preceded by a clinically recognized complication occurred in approximately 14 per cent of the control group and in 12 per cent of the treated group. Anticoagulants reduced the death rate largely by reducing the number of deaths due directly or indirectly to thromboembolism.

The death rates by week of illness were highest during the first two weeks, but were still considerable through the fourth week. For each period the death rate for the control patients was significantly higher than that for the treated group. To give maximum protection, anticoagulants should be continued for at least four weeks after the last thromboembolic episode.

The greatest reduction of mortality was in patients 60 years of age or older. While the crude death rates for patients under 59 years of age in both the treated and control groups did not show a significant difference, the incidence of thromboembolic complications was high in the younger age groups and the incidence of thromboembolic complications was much lower in the treated than in the control group.

Twenty-five per cent of the control patients and 11 per cent of the treated patients had at least one thromboembolic complication. However, in the treated group, the first complication developed in 3.5 per cent of patients before they had received any anticoagulant and 1.5 per cent during the first three days of anticoagulant therapy, before Dicumarol is ordinarily fully effective. Thromboembolic complications developed in only 6 per cent of the patients during the time they were under the full effect of anticoagulant therapy.

The number of thromboembolic complications diagnosed clinically per 100 cases was 36 in the control group and 14 in the treated group. Only 6.5 thromboembolic complications per 100 treated cases occurred in patients who were under the full therapeutic effect of anticoagulant therapy. This figure includes some complications in patients who were not under adequate anticoagulant therapy at the time the complication occurred.

The highest incidence of thromboembolic complications among the control patients occurred in the age group between 50 and 59 years, in distinct contrast to the death rate by age groups. Apparently, younger patients have thromboembolic complications commonly but are able to survive them. Older patients are more liable to succumb to the first thromboembolic attack. This indicates the importance of preventing thromboembolic phenomena in all age groups. Within the treated group, when distinction is made between those patients who were and those who were not receiving anticoagulants at the time of the complication, the effects of anticoagulant therapy are further emphasized.

When the rates of thromboembolic complications by week of illness are considered, the advantage of using anticoagulants is clearly demonstrated through the first four weeks of the illness. Since it is impossible to predict during the first week whether thromboembolic complications will develop during subsequent weeks, it is important to give anticoagulant therapy to all patients with coronary occlusion and myocardial infarction unless specific contraindications exist.

Patients receiving Dicumarol had a distinctly better chance of escaping thromboembolic complications of every type and at every site than did those who received conventional therapy alone.

The incidence of severe hemorrhage resulting from anticoagulant therapy was extremely low. Of the 30 hemorrhages observed clinically, 15 were mild, 14 were moderate, and only one was severe.

EXPERIMENTAL OBSERVATIONS

Blumgart and his co-workers[4, 5] produced experimental myocardial infarction in dogs by ligating the anterior descending coronary artery. Dicumarol was administered to some animals, and heparin and Dicumarol to others, immediately following the operation, in order to determine if adverse myocardial changes might result from anticoagulant therapy. The animals were sacrified at various intervals and the heart was examined grossly and microscopically. Fourteen animals received Dicumarol only, three

received heparin for several hours postoperatively until the effect of Dicumarol was apparent, and 15 did not receive anticoagulants but served as controls.

The incidence and magnitude of hemorrhagic extravasations on the endocardium and pericardium and of miliary hemorrhages in the myocardium were similar in the treated and control animals. In the few dogs with excessively prolonged prothrombin time there was no increase in myocardial hemorrhages. The size of the infarcts and the rate and character of healing did not differ between the treated and control groups. No mural thrombi were found in either group of dogs. The development of collateral anastomoses between the coronary arteries was the same in both groups.

The investigators concluded that Dicumarol produces no adverse effect on the myocardium of dogs which might retard the healing or the development of collateral circulation in experimentally produced myocardial infarction.

Beattie and co-workers[3] determined the effect of Dicumarol upon experimental occlusion of the descending branch of the left coronary artery in dogs. Comparison of the control and treated groups showed similar electrocardiographic and pathological findings. Grossly and microscopically, there was no evidence of propagation of coronary thrombi or of formation of mural thrombi in either group. In appearance and size, myocardial infarcts were the same in one group as in the other. Hemorrhage into the infarcted areas was not prominent in either group. Electrocardiographic changes included, singly or in combination, RS-T segment displacements, changes in the direction of the T waves, ectopic rhythms and conduction disturbances typical of those in similar ligation experiments previously reported. Similar changes occurred in the treated and in the untreated animals.

LeRoy and Nalefski[14] investigated the influence of Dicumarol on the healing of experimental myocardial infarction produced by ligation of the descending branch of the left coronary artery in 32 dogs. Dicumarol was administered to 15 dogs, ten dogs served as controls, and seven died within 24 hours. The animals were sacrificed in from five to 21 days postoperatively.

Grossly there was no significant difference in the appearance of the infarcts at any stage of healing. Mural thrombi were not found in any heart. Microscopically, there was no obvious difference between the healing infarcts in the treated dogs and those in the controls. Serial electrocardiographic studies revealed no variation in the rate or character of the evolutionary changes. It was concluded that Dicumarol therapy does not have any demonstrable deleterious influence on the healing of experimental myocardial infarction in dogs.

LONG-TERM THERAPY WITH DICUMAROL

The administration of Dicumarol over long periods of time may be advisable as a prophylaxis against thromboembolism in patients who are predisposed to the repeated occurrence of thromboembolic phenomena. Anticoagulant therapy may be indicated for the remainder of the patient's life. The patient for whom this type of therapy is most definitely indicated is one with rheumatic heart disease complicated by valvular damage and auricular fibrillation with periodic release of showers of emboli to the pulmonary or peripheral circulation. Any patient with heart disease associated with auricular fibrillation or with an intracardiac source of emboli may be a candidate for prolonged anticoagulant therapy.

Wright[36, 37] reported briefly on a series of patients with rheumatic heart disease and auricular fibrillation who had experienced multiple emboli and to whom Dicumarol was given to prevent the further development of mural thrombi and the subsequent detachment of emboli.

Foley and Wright[8] reported in considerable detail on these and additional cases. A total of 19 patients had been on Dicumarol for periods of from five to 20 months (average 11 months). The favorable results were no less than dramatic and, in certain instances, patients who had been invalids and in constant fear of death prior to anticoagulant therapy, led completely normal, active lives thereafter.

Sprague and Jacobsen[31] reported a case in which a patient who had rheumatic heart disease with periodic arterial embolism remained free of thromboembolic complications during 11 months while under ambulatory treatment with Dicumarol.

It may also be advisable to administer anticoagulants over an indefinite period of time to patients with recurrent coronary thrombosis and myocardial infarction. In 1945, Wright[35] suggested that the question of continued use of Dicumarol as a prophylactic measure in patients who had experienced a coronary thrombosis warranted further study.

Foley and Wright[8] reported upon five patients who had coronary thrombosis with myocardial infarction and who were treated with Dicumarol for periods up to nine months. No thromboembolic or hemorrhagic phenomena occurred in these patients during the period of observation, and the patients led essentially normal, productive lives.

Nichol[20] and Nichol and Fassett[21] administered Dicumarol to patients with coronary artery disease over long periods of time. The report by Nichol and Fassett concerned five patients who had had multiple attacks of coronary thrombosis prior to the administration of Dicumarol for periods of from six to 32 months. One patient who was given Dicumarol for 21 months died of acute coronary occlusion which the authors attributed to lack of necessary control of anticoagulant therapy. A second patient had not had an attack for three years while Dicumarol was given, although he had had three attacks of acute coronary occlusion during the 13 months prior to the administration of the anticoagulant. The other three patients had been on Dicumarol for from six to seven months without recurrence of occlusion.

Nichol and Fassett noted a decrease in the amount of angina during the time these patients were taking Dicumarol. They expressed belief that long-term therapy with Dicumarol is rational and safe, providing the prothrombin time is determined carefully and at frequent intervals. Nichol stated that he had administered Dicumarol to 64 patients in 70 attacks of acute coronary thrombosis: 11 died, a mortality rate of 15.7 per cent. In 40 initial attacks so treated, there had been but one death.

Nichol and Borg[22] reported further experience with long-term therapy in 68 patients who had had one or more attacks of coronary thrombosis and/or myocardial infarction. At the time of report, 36 patients had been on Dicumarol for three to 12 months, 20 for one to two years, 11 for two to three years, and one for five years. Prothrombin time was determined at weekly intervals after the patient had become ambulatory and an attempt was made to maintain the prothrombin time at a value twice normal, the equivalent of a reduction in the prothrombin activity to between 10 and 30 per cent of normal. The dose of Dicumarol averaged 60 to 75 mg. a day. Hemorrhage occurred in one-fourth of the patients, usually due to the presence of some pathological lesion, or to an overdose of Dicumarol. In only three cases was anticoagulant therapy abandoned because of hemorrhage.

Nine patients discontinued therapy; two of them died later of recurrent attacks of coronary occlusion. Ten patients died while taking Dicumarol, and in six of those cases autopsy was done. There was a fresh coronary thrombosis, or an infarction, in two instances and a cerebral hemorrhage in one instance; in three cases death was ascribed to ventricular fibrillation or to congestive heart failure. In two of the four cases in which autopsy was not done, the patients died of recurrent coronary thrombosis. Of the 49 patients remaining on Dicumarol, all were active in business or household duties. Although four had had episodes of acute coronary insufficiency, infarction had not occurred, and uncomplicated recovery had followed. The patient who had been on Dicumarol for five years without an attack of coronary thrombosis during this time had had three attacks prior to anticoagulant therapy.

THE USE OF DICUMAROL IN CONGESTIVE HEART FAILURE

Patients with congestive heart failure are prone to develop thromboembolic complications which increase the morbidity and mortality of the disease. Kinsey and White[12] reported the presence of pulmonary infarction in 24 of 50 cases of congestive heart failure in which autopsy was done. Carlotti and associates,[6] in a study of pulmonary embolism in 273 patients admitted to the medical service of a hospital, found that the admission diagnosis in 104 instances was congestive heart failure.

Patients with liver damage are liable to have reduced plasma prothrombin activity and to react in an extremely sensitive manner to a given dose of Dicumarol (that is, they are liable to be "hyperreactors"). Reisner, Norman, Field and Brown[28] determined the prothrombin time in 100 male subjects before and following a single dose of 100 mg. of Dicumarol. No patient was selected whose prothrombin activity was not normal initially. The prothrombin time was determined on whole plasma each day until it had returned to normal. Extensive liver function tests were carried out and observations were made of the size of the liver, the presence or absence of ascites, and the presence and degree of congestive heart failure.

Depression of prothrombin activity to less than 60 per cent of normal occurred in 28 patients, 93 per cent of whom had evidence of liver disease or congestive heart failure. The patients with the most profound depression had extensive liver damage as indicated by the presence of ascites, hepatomegaly, positive reaction to cephalin flocculation tests and inverted albumin-globulin ratios. Among 33 patients with congestive heart failure, 14 (42.4 per cent) were "hyperreactors" as manifested by a depression of prothrombin activity to below 60 per cent following the single test dose of Dicumarol. Three of these patients had other liver disease as well. Twenty other patients with congestive heart failure (57.6 per cent), three of whom had other liver disease as well, did not have a reduction of prothrombin activity to less than 60 per cent of normal following the test dose of Dicumarol.

The high incidence of congestive failure among the hyperreactors to Dicumarol is evidence that hepatomegaly due to congestive failure indicates a physiologically deranged liver. This conclusion is supported by the results of liver function tests. It is also evident that the presence of congestive failure may alter the response to Dicumarol. The response to a single test dose of Dicumarol is a sensitive test of liver function.

Anderson and Hull[2] administered Dicumarol to alternate patients with congestive heart failure in addition to employing the usual conservative methods of therapy. Patients with plasma prothrombin activity of 50 per cent of normal or less at the time of admission ("low prothrombin group") were not given Dicumarol. The series consisted of 142 patients, consecutive and unselected except for a small number eliminated because of the presence of jaundice, severe angina, or azotemia. Sixty-one were given Dicumarol, 58 served as controls and 23 were in the "low prothrombin group."

There was no correlation between the degree of hepatic enlargement and the reduction of plasma prothrombin activity. However, in 43 per cent of the patients with an initially low prothrombin activity, congestive failure had been first observed more than a year previously, suggesting that the disturbance of prothrombin formation might be related to long-standing or recurrent hepatic congestion.

A reduction of prothrombin activity to 10 to 30 per cent of normal was attained in 52 (85 per cent) of the 61 patients given Dicumarol. Adequate reduction was usually attained within 48 to 72 hours, but

there was pronounced variation in response to Dicumarol in individual cases. Menadione® was given on six occasions when the prothrombin activity fell to below 10 per cent of normal and in each instance the prothrombin level returned promptly toward normal. Hematuria was noted microscopically in several instances, and gross hematuria once in the presence of an indwelling catheter. No serious toxic effects attributable to Dicumarol were observed.

The average duration of hospitalization was almost exactly the same in the three groups. The mortality rate in the treated group was 11 per cent, in the control group 18 per cent, and in the "low prothrombin" group 9 per cent.

Thromboembolism may have been a factor in the death of two patients in the treated group and of seven patients in the control group. One of the two deaths in the "low prothrombin" group may have been related to pulmonary embolism. Definite pulmonary embolism or acute pulmonary infarction occurred in five patients—three in the treated group (but before the first dose of Dicumarol was given) and two in the control group. All five patients recovered. If the proved, probable, and possible instances of thromboembolism, fatal and non-fatal, are pooled, the number of thromboembolic complications in the entire series of 142 cases is 14 (10 per cent). Five (8 per cent) occurred in the treated group and nine (15 per cent) in the control group.

Anderson and Hull summarized: Among 61 patients with congestive heart failure to whom Dicumarol was given, it was possible to reduce and maintain the prothrombin activity at 30 per cent of normal or less in 52 patients (85 per cent) without apparent harm. Among the 61 cases only two suggestive and no certain thromboembolic complications occurred following the administration of Dicumarol. In four patients who had had pulmonary infarction prior to the use of Dicumarol, no further episodes occurred after Dicumarol was given. The mortality rate was lower and the apparent incidence of thromboembolism less in the group of patients who received Dicumarol than was the case in a closely similar group of the same size in which no anticoagulant was employed; but there is no certainty that the difference in mortality rate is significant, or that the apparent difference in the incidence of thromboembolic complications is real.

All patients admitted to the Veterans Administration Hospital in Minneapolis because of cardiac decompensation were treated with Dicumarol after October 1946. The report by Wishart and Chapman[33] is a preliminary evaluation of the therapy as carried out in August 1947. Sixty-one patients with congestive failure were treated with Dicumarol. In 19 patients (31 per cent) auricular fibrillation was present and there were definite signs of mitral stenosis in 11 (18 per cent).

The prothrombin time was determined each day and the prothrombin concentration was kept between 10 and 30 per cent of normal. The average initial prothrombin concentration, before Dicumarol was started, was 62 per cent of normal and in one case it was only 17 per cent—evidence of seriously impaired liver function secondary to congestive failure. Dicumarol was administered in most cases until the patient was ambulatory or until death supervened. The average daily dose of Dicumarol for an adequate effect was 78 mg., confirming the view that patients in cardiac failure require smaller doses of Dicumarol than do compensated persons. No hemorrhagic complications developed, although it was often necessary to suspend Dicumarol therapy because of excessive depression of the prothrombin activity. Vitamin K was occasionally administered to counteract an excessive Dicumarol effect.

The mortality rate was 32.8 per cent (20 deaths) and 12 autopsies were done. There were no deaths definitely attributable to pulmonary embolism, and in 19 instances death was not suggestive of this complication. Emboli were not found in any of the 12 autopsies. Because of the difficulty of establishing the diagnosis of pulmonary embolism and infarction in every instance, symptoms and signs thereof were carefully sought and thoroughly investigated. Definite pulmonary infarcts developed clinically in two patients on Dicumarol therapy, but during a time when the Dicumarol effect was inadequate. Pulmonary and systemic infarcts were present in six of the 12 cases in which autopsy was done, but in five instances these lesions had developed before or after Dicumarol therapy. In one case pulmonary infarct developed despite adequate doses of Dicumarol.

With the clinical and postmortem evidence combined, it is probable that embolic phenomena developed in four cases (6.5 per cent) despite adequate Dicumarol therapy. Previously published reports indicate that in a group of comparable patients not given anticoagulants, the expectancy would be for pulmonary emboli in more than 20 per cent.

COMMENT

It is apparent that, with the exception of the American Heart Association study, there is no series of patients with heart disease who have been treated with anticoagulants which is of sufficient magnitude, or sufficiently well controlled, to warrant statistical evaluation. However, it ought not be ignored that in every series reported in the literature the results of treatment with anticoagulants have been favorable, consisting usually of a considerable reduction in the incidence of thromboembolic complications and of a more modest, although frequently significant, reduction in the immediate mortality, either in comparison with a control series, or with the anticipated occurrence of such complications and deaths as judged by the literature or the personal experience of the authors.

Nichol[23] observed recently that the composite mortality rate in 656* cases of acute coronary occlusion with myocardial infarction treated with anti-

*The aggregate of cases covered in eight independent reports in the literature (excluding the American Heart Association report and reports of series included in that study).

coagulants was 13.1 per cent. In contrast, he found that the immediate mortality rate for an aggregate of 2,325 cases† in which anticoagulant therapy was not used, was 28.8 per cent.

The use of the anticoagulants in the treatment of certain types of heart disease is based upon the frequent occurrence of thromboembolic complications and upon the importance of these complications in increasing the morbidity and mortality rate. The advocates of anticoagulant therapy cite the studies of Eppinger and Kennedy,[7] Nay and Barnes,[17] Wartman and Hellerstein,[32] Hellerstein and Martin,[9] and Mintz and Katz[16] as evidence that thromboembolic phenomena do complicate certain types of heart disease commonly and that they do significantly increase the immediate morbidity and mortality rates. To those critics who deny the importance of thromboembolism in the types of heart disease mentioned in this review, the answer is, obviously, that they must be overlooking such complications.

The essential problem at present is to attain means whereby the anticoagulants may be administered both effectively and safely to patients with heart disease. As has been acknowledged repeatedly, heparin and Dicumarol can be administered effectively and safely only in experienced hands and where suitable laboratory facilities exist. That hemorrhages do (infrequently) occur as a result of anticoagulants, and that they are often serious and occasionally fatal, is undeniable; but reports of such untoward reactions demonstrate beyond reasonable doubt that the greatest single factor in the production of hemorrhage in the circumstances is human error—erroneous diagnoses, careless or misguided administration, and failure to observe the meticulous management which is essential to the safe and effective use of these drugs.

There is no promise of simpler, more error-proof and more economical laboratory tests for following the course of patients being given anticoagulants. There is no immediate promise of a clinically useful and economical substitute for heparin, although Paritol® or some similar substitute may, in time, prove to be valuable. There is evidence, however, that the coumarin Tromexan®—the ethyl ester of di-(4-hydroxycoumarinyl) acetic acid—may prove to have certain distinct advantages over Dicumarol in clinical practice.

As a practical matter, it must be suggested that the physician who cannot administer the anticoagulants in an expert manner, who cannot obtain exacting laboratory control, and who cannot maintain close observation of patients, should avoid the use of anticoagulants except when the indications are absolute. He should probably use no other anticoagulant than heparin in those instances in which he does administer this type of therapy. He should not attempt to manage patients on long-term therapy but should refer them for that kind of preventive care.

†Aggregate of 14 series reported in the literature since 1940.

In circumstances in which laboratory control is precise and the physician can provide meticulous observation of the patient, the anticoagulants may be administered effectively and with a minimum of hazard from hemorrhage if the following essentials are observed in all instances: (1) accurate diagnosis; (2) determination of the clotting time or of the prothrombin time, according to the drug being used, before any anticoagulant is administered and each day thereafter until the response of the patient is clearly determined, whereupon such studies can be made on alternate days, twice a week, or, occasionally, at weekly intervals; (3) exacting laboratory control according to the rigid standards described by all workers in this field of therapy; (4) administration of the anticoagulant to produce the optimum therapeutic effect; (5) frequent and careful observation of the patient; (6) continued administration of the drug until the hazard of thromboembolism is removed. Anything short of these criteria will lead unnecessarily to failure and to the eventual disrepute of therapy of this type.

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Non-Directive Psychotherapy

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SUMMARY

Psychotherapy is a word to describe an age-old process. It would be better not to speak of psychotherapy, but of psychotherapies. Specialists are not the only ones who act as psychotherapists, since every human being fills this role at one time or another. Besides this, no two persons follow an identical approach. Finally, all therapists change technique constantly. The kinds of psychotherapy must therefore approach infinity.

Some physicians appear to assume that only one type of psychotherapy may claim a scientific basis. Although Freud first put psychotherapy on a scientific path, there is no reason to say that Freud must be the last in this field.

Over the past few years a new trend has started in psychotherapy which deserves close study. This new trend challenges some old beliefs and gives a new tool to help patients of some types. It is called non-directive or client-centered psychotherapy. This therapy does not try to solve the patient's problems for him, but rather establishes the conditions under which a patient can work out his own salvation.

Each year non-directive psychotherapy grows in importance. Much can be learned from the method.

TODAY every physician talks about psychotherapy, psychiatry and psychosomatic medicine. Much of this interest has come within the past ten years. Because of this recent prominence, it may be forgotten that what is described by the words psychotherapy, psychiatry and psychosomatic medicine goes far back in human history.

Much depends on what is meant by these words. Psychotherapy in its broadest sense implies that someone changes some of his actions or some of his thinking after contact with someone else. Applied too broadly this would include under psychotherapy some curious reactions, like the effect of a college girl in her Bikini bathing suit on her boy friend, or the influence of Hitler on Chamberlain in Munich. In each case someone brings about an effect on someone else by other than physical force.

It is not to be expected that everyone will like the same kind of psychotherapy. Generally speaking, the kind known best is the kind preferred. Patriotism works in somewhat the same way. Normal persons love best that country with which they are most familiar.

To show a few types of therapy in common use, three varieties can be touched upon — therapy of command, therapy of exhortation, therapy of reassurance. A therapist who commands will call upon some law to back him up, such as a divine law, a state law, or a "law" of human nature. A therapist who exhorts tries the "Dutch uncle" approach, telling the subject he owes it to himself, his family or his community to change his ways. A therapist who reassures may soothingly hypnotize with his constant denial that any real problem exists, and so lull the subject into a temporary peace of mind. Not a few psychiatrists use one or more of the above techniques at some time during therapy. So do parents.

When physicians think of the best psychotherapy most of them turn to the work of Freud and his followers. What Freud did can never be overestimated. He threw off the mantle of shame and superstition that had cloaked mental and nervous disease, and founded modern psychotherapy. But Freud did not stop all further advance.

Freud and his followers, through their writings and lectures, have been influential in popularizing the idea of psychotherapy. Psychoanalysis found a place in popular fancy, so that Hollywood and most laymen doubt they get their full money's worth without it.

Though psychoanalysts follow Freud more closely than others, in their ranks are variations. Some psychoanalysts, like Horney,[3] discard a few of Freud's pet theories. Any science or person shows a sign of growth if able to stand criticism. By refusing to hold too sacred everything Freud wrote, psychoanalysts can best imitate him who never in his life bowed to any authority.

Behind their diversity, psychoanalysts often seem to agree that they should control, or guide, or direct patients. Psychoanalysts also give the author an impression, perhaps a mistaken one, that psychotherapy calls for someone very wise, who knows most of the answers about humans, and who can vigorously direct patients in the best method to solve problems.

Non-directive or client-centered psychotherapy challenges some of these assumptions. The word "non-directive" follows a modern trend which also helped name other sciences like non-Euclidean geometry, non-Newtonian physics, non-Aristotelian psycho-logics (semantics).

A good way to introduce discussion of non-directive psychotherapy might be to compare it with parts of Dante's epic, "The Divine Comedy," which begins,

> In the midway of this our mortal life
> I found me . . . astray
> Gone from the path direct.

A physician today might prefer to say that "Dante was mixed up and in need of psychotherapy." In the poem, Virgil comes by fate to Dante's aid, and leads him through a frightening Inferno and Purgatorio. As Dante goes through these places, he learns much. and emerges a wiser, more adaptable man, ready for Beatrice to take him through the Paradiso.

If Virgil can be called a psychotherapist for Dante, it is worth noting that Virgil does not command, or exhort, or do much to reassure Dante. Most of the time Virgil walks along with Dante, calls attention to bits of interesting sadism going on, and names certain persons and places when asked. Dante, the patient, talks three times as much as Virgil, the therapist.

Some quotes tell what therapy Dante received: "My teacher [my therapist, Virgil] . . . with so composed a lip he listen'd ever to the sound of the true words I uttered." (Virgil can hold his lips tightly shut while Dante talks.) "Consult thy knowledge," says Virgil. (Virgil does not try to give all the answers.) "Now seest thou, son—" (Virgil often is content to point out something, with no explaining.)

Although Virgil talks, his words do not appear his main duty. When Dante hesitates to enter the Inferno:

> "And when his hand he had stretch'd forth
> To mine, with pleasant looks, whence I was cheer'd
> Into that secret place he [Virgil] led me on."

All through the poem when Dante turns in terror and despair to Virgil for comfort, Virgil seems to say this: "Yes, Dante, you see what you see. You are learning and seeing things you may not like. But you see reality, and you are scared. I know." When, in his agony, Dante pleads with Virgil, he is saying, "Tell me, Virgil, do you see what I see?" Then Virgil replies in substance, "It scares you, doesn't it?"

TECHNIQUE OF NON-DIRECTIVE PSYCHOTHERAPY

Like most psychotherapy, non-directive psychotherapy leans heavily on talk, on words. In non-directive psychotherapy a patient converses, expresses himself freely in words, on whatever topic he pleases. "Non-directive" give the clue. This does not mean that the therapist does nothing but stay awake. He must listen with care, and accept whatever emotion or feeling the patient expresses. To this emotion a therapist responds as to an emotion, not insisting very much on factual accuracy or falsity of words.

Words normally have a partly factual, partly emotional content. Each part may vary from less than 1 per cent to more than 99 per cent. For instance, what if a patient says, "My boss is a damn fool"? The therapist learns little fact about the boss. Factually he learns that the patient works under a boss. Surely no therapist will stake his reputation on the "fact" that the boss in question has a low I.Q. and is doomed to hell fire. From the phrase, "my boss is a damn fool," one fact relevant to therapy is learned: At that instant the patient hates his boss. Little fact, much emotion. Non-directive psychotherapy evaluates the emotional content of words. and responds to it. How? By accepting the emotion. not arguing about the fact.

In practice how might a therapist respond to the phrase, "My boss is a damn fool"? Certainly not. "Yes, I know the so-and-so. You put it mildly." Neither does he try to palm off some esoteric formula like, "You project your feelings in reference to your employer's dominance." In non-directive psychotherapy a possible response might be, "You are very upset with your boss right now." For one who likes a formula, non-directive psychotherapy begins like this: Evaluate the words of the patient, and respond to those words by showing acceptance of their emotional content. In other words, the therapist shows that he grants the patient the right to be upset. (He ought also to warn himself to distrust formulas.)

This looks pathetically easy. Yet even a very understanding physician may not find it so easy. Physicians too often fall into the modern habit of not hearing much of what others say. In our culture, conversation, in the sense of an attempt to understand one another, has become a lost art. A patient may stay so wrapped up in his own emotions that in turn he finds it impossible to fully grasp what a therapist may say to him. To make things worse, physicians have become expert talkers in vague generalities. As Francis Bacon put it, our words "are as the stars, which give little light, because they are so high."

Somewhere along the way, as most of us muddle through our schooling, we develop a blind trust in the literal or factual content of words. But no word can mean the identical thing to two persons, nor keep its identical meaning for the same person at different times. Although we grasp this more or less. we get fussed that words slither around, or get up and walk away like Alice's wickets. We tend generally to "ascribe to words an entirely false value and certitude which they cannot have."[6]

Words express our relation to things, in part intellectually, in part emotionally. When a communist froths at the mouth and calls all of us "American capitalistic slaves," he chiefly tells us that he himself is quite unhappy. Or as in the present furor over "homosexuals" in the government departments at Washington, the more fervid denouncers may be trying to exorcise their own homosexual impulses. To find words with an almost total factual content we read cook books ("add two eggs and stir"), or laboratory guides ("watch the solution boil and see what happens"). At the opposite extreme, when a patient says "Life is not worth living" the physician knows he is listening to emotion, 99 per cent plus.

Ability to listen to words compares to music appreciation. With no "ear" for music, we hear mostly a jumbled noise at a symphony. Some amateurs learn to pick out various movements. Trained musi-

cians can hear each instrument as it blends into the whole. Toscanini, they say, can hear one tiny, single false note. If perfect, non-directive psychotherapy would offer a patient an equally skilled, trained ear to catch every emotional tone. Probably few, if any, therapists can do this, but all can aim to do it.

Non-directive psychotherapy does not direct a patient in what he says, or when or how he says it. Often, for the first and only time in his life, a patient can talk freely, with someone to actually hear him. Meanwhile, as a patient expresses his feelings, he meets a warm reception, but with no praise and no blame. A non-directive therapist should be thought of not as a judge of another's misdemeanors, but as a realist who takes people as he finds them, and accepts them as such.

Those who analyze non-directive psychotherapy use phonograph records to follow along and explain what goes on. Many times records have caught every single word spoken by patient and therapist from first to last contact. When a therapist listens to himself speaking to a patient the chastening process is said to demand a lot of humility. Then, if never before, a therapist hears how much he talks, how vapid he may sound, how much direct pressure he exerts on the patient.

When we think about it, most of us can only marvel at our skill in saying the wrong thing. Take this horrible example. Once I visited a child with mumps. I had been the family physician for some time. On leaving the child's bed, I said something like, "Won't your dad look funny when he gets the mumps?" If you think that very unfunny, so did the family. They shifted to another doctor who had no delusions of being a humorist. You may call that family touchy, as I did. Yet all in all, could not my remark have been omitted to everyone's gain?

In non-directive psychotherapy, if never before, a therapist learns that every word counts, every word he utters will help or hurt. Careless talk has no place in non-directive psychotherapy. We doctors do take ourselves too seriously often enough, but we do not take seriously enough what we say to patients. We may imitate to our sorrow Alice in Wonderland: "At least—at least I mean what I say—that's the same thing, you know." "Not the same thing a bit," said the Hatter. In a certain field the Mad Hatter was not mad.

So in non-directive psychotherapy the patient finds he can express his feelings on any subject, self, family, relations, neighbors, employer, therapist. He decides what to take up, when, how, what to say or omit. The patient becomes the active one, the doer, the star of the show. As he finds the therapist accepts him and his emotions, he keeps on going, probes ever deeper. If the therapist opposes him, rejects him, directs him, he may flounder in a vague generality of words. A patient "knows" or "senses" what hurts him most, what he wants to talk about, how, and when each topic can bear to come to the surface. Prying often does more to harm than to help.

Who can profit by non-directive psychotherapy? Time will give the answer. No one claims that non-directive psychotherapy cures every nervous and mental problem. Non-directive psychotherapy does not try to replace psychoanalysis where "deep" therapy may be called for. On the other hand, it yearly seems able to extend its usefulness and help more and more patients. Where it will stop cannot be foretold. Rash claims of super-success and rigid limits to its use both alike appear unwise.

Some experts give definite criteria to select suitable patients: (1) A certain maturity of the patient, plus some ability to change. Both requisites occur most often in the age span from 15 to 50 years. (2) Average or superior intelligence. (3) No hopeless physical handicap. (4) No total dependence on others. (5) No overwhelming environment. (6) Enough emotional stress.[11]

STEPS IN NON-DIRECTIVE PSYCHOTHERAPY

Anyone who has ever tried to write a textbook has learned that in describing any process he often winds up with crude artifacts. For instance, every well-trained anatomist knows that the layers of pelvic fascia are mostly dissection artifacts. Yet books find it helpful to describe the "layers." In a similar way, if the point is not pressed, non-directive psychotherapy may be divided into steps. An expert, like Rogers,[11] will describe 12 steps in non-directive psychotherapy. I seem to recognize six steps. The exact number makes no difference.

1. *The Patient Comes for Help.* For therapy a patient seeks someone whom he hopes will help. Obviously. But why? Patients look for help only after emotional pressure builds up to a certain point. To open up and probe into our feelings in the presence of another person will beget some pain. And few, except mental masochists, court pain unless inner tension gets unbearable. Some day that may change, and patients may seek help earlier. But today most patients will endure a lot of grief before they feel the urge to pour it out. Patients do not have much idea of where to look for help, and their inertia holds them in a rut until pain makes them seek help. Also it wounds our pride to admit that we need assistance.

A therapist usually furnishes a place to talk. Patient and therapist decide on a time convenient to both. From the first a patient may act like a skater on thin ice, and hang back on the edge near shore. His wariness shows clearly if he has sought help elsewhere and failed to find it.

If a patient finds a friendly reception (experiences good rapport) with no restraint on how he expresses his feelings, the phase of exploration may end early in the first interview. Many techniques are reported needed for rapport. Basic to them all, I believe, is this—a therapist who has solved a major part of his own conflicts, who will sit quietly, without fidgeting, and listen with obvious care and interest.

While at college we used to describe a fellow

student as "a guy who hopes to find that heaven is one large ear." No doubt he needed a kindly therapist. One who can listen attracts us when we are upset. A listener, not a talker. Even Thomas à Kempis, the monkish author of "The Imitation of Christ," said, "I would that many a time I had kept silence."

2. *The Patient Expresses His Negative Feelings.* Once he feels safe, a patient begins to vent his hates, fears, anxieties, bewilderments. He feels something is wrong. He may not know why. So he tries to tell what he "thinks" about (that is, feels about) things. At first he tends to complain about other persons, or his symptoms. In this he skirmishes on the surface.

Should he find no rebuke, no one to condemn, he shifts to deeper problems, present problems. (Recall the woman of Samaria.[9]) He slowly brings up things he has not admitted to himself, or has long banished from awareness. He may start with blaming others, or with curses for his own tough luck. Before long he dismisses these surface irritants and turns to grapple with his real personal problems.

To pass through this stage takes a variable amount of time, depending on the amount and intensity of stored-up, repressed negative feelings, and the skill of the therapist. In one sense, "deep" therapy means "long" therapy.

Should a patient clam up, quiet, friendly waiting will often start him on once more. Or an occasional acceptance of his plight may be shown by such phrases as "It is not easy to talk about things that mean a lot to us, is it?" Non-directive psychotherapy seems to indicate that we do not have to tell a patient how deep to go into his problems. If we let him alone, do not try to decide where he goes, he will go fast enough, straight enough, and deep enough to suit his individuality.

3. *The Patient Expresses His Positive Feelings.* If the second phase goes well, a strange thing happens. At last, much of the patient's griping stops, sometimes not to return. A patient who began by crabbing at others, at fate and at himself, after a while stops. He has given vent to his feelings, and he feels as relieved as others do after a hearty belch.

To his feelings now, things start to get tolerable, or even worth praise. This about-face, from negative to positive, comes with nearly predictable certainty, if the therapist does not bungle technique. Just to watch this change-over proves again that some words contain mostly hot air. A salesman who spent hours damning his boss now begins to grant his employer some ability for running the office. A teenager who sneered at his dad now admits that his dad won election to office in the Elks. A man who called his wife less than a "dream girl" will now say that she does a beautiful family wash.

In this phase the patient finds symptoms less crushing, his own and others' defects less appalling, the future less bleak. When he can see some of the "good" with the "bad" he starts to achieve insight. He begins to take hold of reality. His emotional tension starts to relax. He accepts himself, his opinions, others and their opinions (even of him) more calmly. Emotional fog begins to lift.

A non-directive psychotherapist tries to accept positive feelings in the same way that he did negative feelings, with no praise, no blame. A therapist acts like a mirror. He reflects the patient's feelings, so that the patient can see himself in new perspective. Any observant person can find in the behavior of children many defects of their parents. In somewhat the same way a patient gradually sees in the therapist many of his own emotions, as he could never recognize them in himself, and with slowly increasing clarity. Yet as the patient reveals himself, a therapist, with his warm acceptance of a patient as he is, differs from the cold rigidity of a mechanical mirror.

4. *The Patient Explores Various Choices.* Once he has expressed his negative and positive feelings, a patient finds he is more free. He can start to consider what to do to change himself and his environment. Strong repressed emotions may destroy or restrict a normal tendency to grow. Ease tension, and growth reasserts itself. A more adaptable personality comes to the front as emotional fogging burns away.

Every modern analysis of how we learn confirms one fact. In learning anything, we hit a plateau every so often. We advance a bit, then level off for a time. Advance more, level off. Advance, level off. Non-directive psychotherapy also shows these plateaus at each stage. When a patient starts to explore various choices, a therapist often may feel like prodding him. Yet insight of the patient, not of the therapist, counts. Non-directive psychotherapy offers evidence that to explore and to choose counts only when done by a patient. Students do not always make the most progress merely by studying under a teacher loaded down by half a dozen degrees.

In his own good time, when he is ready, not before, a patient will decide. He will select what he wants, decide what he can do. His judgment may be astonishingly good. The wisest of therapists often show wisdom best in not offering much by way of solutions. This is one time when light shines very nicely under a bushel.

5. *The Patient Begins Positive Actions.* Once he makes his choice, the patient begins to act. He may be timid, slow. He may dawdle, only to elect such simple things to do that the therapist wants to explode a firecracker under him. After weeks or months of talk the patient may make the world-shaking choice to go to bed one hour earlier at night.

Right there is the point. *He chooses.* He stops drifting. The therapist notes to himself with approval not *what* the patient chooses, but *that* he chooses. For choice and act, like muscle, grow with exercise. No one lies in a sick bed for years, hops out and climbs Mount Wilson the same day. Ther-

apists are liable to the same mistake as parents who want to hurry the immature into maturity. But the immature cannot be hurried. Emotional growth, like pregnancy, may take nine months or more.

With the first small acts chosen, then performed, the patient gains confidence. He begins to show more definite progress. He starts to integrate his acts. When new behavior flows from his own insight and choice, it shows more zest and spontaneity than what he does by command or direction. We get most fun in life when we act as free agents along self-chosen paths.

6. *The Patient Decides to Stop Therapy.* This too falls under the patient's, not a therapist's, choice. The decision to stop depends on many factors, but chiefly that the patient has made several small choices, then carried them out. He feels a bulge or two where once was only flabby muscle. He gets elan from solving some problems to suit himself. He wants to use this new-found confidence. The future he can face unafraid (or less afraid) as he strikes out for himself.

Every chronically ill patient has some chronic nervousness. Often we doctors hang onto patients year after year, getting nowhere. Part of the fault is the patient's, who wants to make us a semi-permanent crutch. But every doctor takes the most pride in that patient who can carry on without further help.

Not that any patient will have solved every life problem the day he leaves his therapist. What counts is his confidence that he can see and answer (or try to answer) his problems. Again, growth does not stop with his last interview. During therapy growth begins, but does not end. In theory, growth continues for life.

If a patient overestimates himself, he may decide to return for further therapy at a later date. Or a new, paralyzing crisis may send him back. To decide to start, to stop, or to resume treatment is up to the patient. The choice is always his.

These six steps vary from patient to patient, for patients differ just as do houses one from another. But millions of homes have four definite parts—places to prepare food, to sleep, to loll, to take care of excretions. So non-directive psychotherapy tends to have certain traits in most cases.

Looking at the other side of the coin, we know that our education often began by some teacher's drumming rules into us. Next we learned so many exceptions that we doubted the value of rules. So the six steps here set forth need not be looked upon as revealed dogma.

THREE QUESTIONS

Three questions arise.

First, if non-directive psychotherapy offers so much, why does it attract so little notice or encouragement from the medical profession? None of my own medical friends seems to have heard of non-directive psychotherapy. At the Los Angeles County Medical Library, two librarians said they had not heard the term, and neither recalled any requests for articles or books on the subject. So I wrote to physicians all over the United States, including a few nationally known psychiatrists. None of those who replied claimed first hand knowledge of non-directive psychotherapy. Up until now I have read nothing about non-directive psychotherapy in any medical journal. A reliable source states that probably no medical journal has published an article about non-directive psychotherapy.

Why so little medical interest in non-directive psychotherapy? Most of the work has come from those outside the medical profession. Carl R. Rogers, Ph.D., and his co-workers have published the most significant papers. Dr. Rogers' book, "Counseling and Psychotherapy,"[11] seems to give the clearest introduction to non-directive psychotherapy. Since non-directive psychotherapy grew in non-medical surroundings, since articles on it were published in non-medical journals, and since the subject created no noisy public controversy, physicians may not yet have heard about it.

Second, does not a therapy that does not guide or direct patients sound absurd? Possibly so, to our ears. But we should not condemn any work on our prejudices. Physicians have ingrained habits of bossing patients, much of which is carried over into the psychotherapy they practice.

Listen to Freud.[2a] "I did not find it easy, however, to direct the patient's attention." "I was obliged to point out to the patient." "I continued my questions."

Psychosomatic medicine takes some direction for granted. "Psychoanalytic insight and guidance in management, combined with reeducation and reassurance prove adequate to handle the emotional factor in the majority of psychosomatic disturbances."[15]

A standard text says,[7] "The physician should proceed to give specific suggestions as to methods of cure." And, "Steady reassurance and encouragement by the physician are important during the early part of this retraining."

My former professor of psychiatry writes,[5] "The doctor's talk to the patient must be positive as well as frank." "The physician must have complete disciplinary control at all times." "Many patients will gain security by developing some dependency upon the physician for a time."

We can multiply such quotations. Yet when we take phrases out of context we risk a distortion of a writer's intent. But most psychiatrists insist uniformly on a dominant role by the therapist. If any author's meaning has been perverted here, it is unintended.

Third, did not Freud stumble upon psychoanalysis merely by letting a patient talk freely? I have heard this many times and have read it once in a while. It may help to look into this claim. One example from Karl A. Menninger, M.D.: "Their [that is, Breuer's and Freud's] discovery came about through a famous but anonymous patient. It was a woman who came in to be relieved of typical ner-

vous symptoms. The lady sat down to tell the doctor her troubles. . . . She had a fluent tongue. . . . By the time she had told her story in full, she was well."[8]

After considerable checking I can find no such origin for psychoanalysis. This is the story: Freud did not meet Breuer until about 1884, having worked in physiology and brain anatomy at least from 1876 to 1882.[4] Not until 1893 did Dr. Joseph Breuer and Dr. Sigmund Freud co-author a few pages in a German medical journal (Neurol.-Centralblatt) on "The Psychic Mechanism of Hysterical Phenomena." Two years later, in 1895, the same two workers put out their famous book, "Studies in Hysteria."[2] In this book we find the same paper of 1893, five case histories, theories by Breuer, an outline of psychotherapy by Freud.

The five case histories were the first ever published by Breuer and Freud. Case 1 told about a patient of Breuer's. Cases 2, 3, 4 and 5 discussed Freud's patients.

Case 1, that of "Anna O.," goes back to 1881. The patient was treated by Breuer alone, long before he met Freud (probably in 1884). Breuer used talking during hypnosis to treat Anna O.[2] "It was a great surprise to me, when for the first time, and accidentally, a disturbance, which had existed for a long time, disappeared in the evening hypnosis through an unprovoked conversation." "The surprising fact that from the beginning to the end of the disease all stimuli originating from the second state as well as their results, had been removed through talking in the hypnotic state." By "second state" Breuer seems to mean what we call the subconscious.

The patient in Case 2, that of "Mrs. Emmy von N.," came to Freud in May 1889. Freud[2] says, "I decided to treat her by that method of investigation in a state of hypnosis which I had learned from Breuer's history of his first patient."

Case 3 was that of "Miss Lucie R." Freud[2] first observed the patient "towards the end of 1892." "She had lost all perception of smell . . . was depressed . . . weak, complained of a heavy head, loss of appetite, and an incapacity for work." "The young lady visited me from time to time during office hours . . . showed a quite distinct general analgesia . . . the nasal mucous membrane was totally analgesic." "On attempting to hypnotize Miss Lucie R. she did not lapse into the somnambulic state. I, therefore, was obliged to forego somnambulism, and the analysis was made while she was in a state which did not perhaps differ much from normal."

Freud did not just listen. He speaks of his interviews with Miss Lucie R. like this: "I asked her." "I told her I did not believe . . ." "She quite agreed with me." "On questioning her . . ."

There can be little doubt that Miss Lucie R. was Freud's famous first patient in psychoanalysis. On Lucie he tried hypnotism, and failed. She and Freud talked, and she improved. With Lucie R. in 1892 psychoanalysis seems to have been born. Yet the sample quotations leave no doubt in my mind that Freud took his usual vigorous part in therapy. We do not see Freud listening passively while Lucie R. talked out her troubles. Nothing I have read of Freud's own works shows me that Freud ever had the idea of non-directive psychotherapy as we know the technique today.

A shrewd appraisal of Freud's approach to therapy is the following. "Freud was quite openly educating his patients in his early praxis, and doing it veiledly in his later praxis."[1]

OTHER POINTS ON NON-DIRECTIVE PSYCHOTHERAPY

1. Non-directive psychotherapy stresses the present. Often a patient can integrate himself without delving into childhood and infancy in minute detail.[11]

2. Non-directive psychotherapy does not use that state of great dependence of patient on therapist, which psychoanalysts call transference.

3. Non-directive psychotherapy favors a weekly interview of about an hour. The total number of interviews tends to be not excessive in number.[11]

4. Non-directive psychotherapy gives evidence that in properly selected cases the failures arise chiefly from blunders by the therapist.[11] This offers a challenge to any therapist's skill.

5. Non-directive psychotherapy demands no superhuman wisdom or unusual personality from the therapist.[11]

6. Non-directive psychotherapy stresses practical results more than theory.[11]

7. Non-directive psychotherapy questions the assumption that few of us can solve our own problems. Most of our mistakes come from emotional turmoil. Average persons have enough intelligence to work out many answers to their problems *if* emotions stop confusing them. Also modern educational theory holds that average persons can gain skill to make intelligent choices. Non-directive psychotherapy develops this skill in learning. Somewhere, some line must be drawn limiting how much and what others shall tell us how to think, how to feel. Non-directive psychotherapy tries to draw this line at the start, making the patient independent of the therapist's direction. This challenges some common modern trends.[12, 13, 14]

CONCLUSION

Our age did not invent psychotherapy. Every culture has tried to provide some make-shift in psychotherapy, some attempts better than others. Our oldest books, like the Bible and Homer, talk of people who knew that discussing one's problems with others would help bring relief. Over 300 years ago Don Quixote said to Sancho, ". . . since you have been running on like this with no one to stop you, you don't feel an ache in your entire body. Talk on, my son; say anything that comes to your mind or to the tip of your tongue."

Non-directive psychotherapy offers a new approach to this human trait, and tries to study condi-

tions which help or hinder success.[10] We do not know the limits of non-directive psychotherapy at present. In selected cases it has given excellent results.

Non-directive psychotherapy may revolutionize much of modern psychiatry, for it shows how to help patients in early stages of psychic disturbance with a minimum of time and maximum of efficiency. It may point the way to rational preventive psychotherapy which we need most of all. Non-directive psychotherapy also can give us hints on how to deal more helpfully with our patients in the everyday practice of medicine.

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CASE REPORTS

- Mediastinitis with Aortic-Esophageal Fistula Following Swallowed Fishbone—Pathogenesis, Diagnosis, and Prophylaxis
- Term Pregnancy Following Removal of Right Ovary and Left Corpus Luteum Cyst
- Hepatitis and Nephrosis Due to Cough Syrup Containing Chloroform

Mediastinitis with Aortic-Esophageal Fistula Following Swallowed Fishbone—Pathogenesis, Diagnosis, and Prophylaxis

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ALTHOUGH perforation of the esophagus by a foreign body with subsequent complications is discussed in detail in the American literature, there are only a few reports of perforation of the aorta secondary to such a lesion. A review of the literature and several isolated case reports have appeared recently in the foreign literature. Features presented in them were similar to those in the following case report. In the authors' opinion these features characterize a recognizable clinical syndrome calling for heroic therapy.

CASE REPORT

A 58-year-old white American female entered the hospital April 13, 1948, three hours after swallowing a bone from a "buffalo fish." The patient complained of sharp and constant pain in the thyroid region and in the mid-sternum with radiation to the interscapular region. The past and family histories were non-contributory. No significant abnormalities were noted upon physical examination. Repeated fluoroscopic and x-ray studies of the chest and esophagus after barium and barium-soaked cotton swallows revealed no evidence of the presence of a foreign body or of perforation. The patient was discharged the next day with instruction to return if further difficulty developed. Seven days later she was readmitted with complaint that during the week she had had intermittent aching pain at the xiphoid process and substernally beneath the angle of Louis, radiating to the interscapular region and intensified by the swallowing of solid food or liquids. Six hours before readmission the patient had vomited one to two pints of bright red blood, then had fainted and upon regaining consciousness had perspired freely. The temperature was 101° F., the pulse rate 90 per minute, and respirations 16 per minute. The blood pressure was 160 mm. of mercury systolic and 80 mm. diastolic. In a physical examination no significant abnormalities were observed. Hemoglobin content of the blood was 13 gm. per 100 cc. Leukocytes numbered 6,300 with normal cell differential. The urine was normal. Bleeding time, clotting time, non-protein nitrogen level and liver function profile series were all within normal limits. Esophagoscopy was carried out. There was no foreign body or bleeding point in the entire esophagus, but blood clots were observed immediately beneath the cricopharyngeus and a biopsy specimen from a thickened area 3 cm. below the cricopharyngeus was reported to show leukoplakia. Therapy consisted of parenteral administration of vitamins K and C, a transfusion of 500 cc. of whole blood, and sedation. The following afternoon hematemesis (900 cc.) occurred, and the patient immediately went into profound shock. Transfusion of 1,800 cc. of whole blood was required to raise the blood pressure to 130 mm. of mercury systolic and 90 diastolic. At this time, roentgenologic study of the upper gastrointestinal tract, which was carried out to determine the point of bleeding as a guide to surgical treatment, showed no definite esophageal lesion, although there appeared "to be extrinsic pressure, perhaps from glands in the mid-esophageal area." No varices could be demonstrated fluoroscopically. The stomach was dilated and apparently contained clotted blood. A circular defect along the greater curvature of the fundus was noted. Pronounced pylorospasm prevented filling of the duodenum. In view of the equivocal nature of the findings, operation was postponed, but after another uneventful 24 hours, hematemesis of approximately 1,000 cc. occurred. Exploratory laparotomy with wide gastrotomy and duodenal exploration was carried out but the source of bleeding was not found. For three days postoperatively the patient improved, then bleeding began again and deep shock ensued despite multiple transfusions. The patient died 19 days after swallowing the fish bone and 12 days after the first hemorrhage.

AUTOPSY

Significant findings at autopsy were limited to the esophagus and aorta. At the level of the fourth thoracic vertebra there were two irregular defects in the posterior wall of the esophagus (Figure 1). Each measured 5 mm. in diameter and they were 5 mm. apart. The adjacent esophageal wall was not indurated. The stomach was considerably dilated and filled with fresh blood and blood clots.

The esophageal defects communicated with a mediastinal hematoma 5 cm. in diameter and the mediastinal tissue surrounding it was indurated. Communicating with the hematoma at the junction of the arch and descending thoracic aorta in the anteromedial aortic wall and just medial to the origin of the left subclavian artery was an 8 mm. opening with smooth, slightly raised, rolled borders (Figure 2). The right subclavian and common carotid arteries originated directly from the arch of the aorta.

Numerous slightly calcified, occasionally ulcerated atheromatous plaques were observed throughout the aortic intima. There was no evidence of an aortic aneurysm.

Examination of the microscopic sections from the borders of the esophageal perforation showed acute inflammatory changes characterized by edema and heavy cellular infiltration (Figure 3). This infiltration consisted predominantly of polymorphonuclear leukocytes, but lymphocytes and mononuclear cells were also present. These changes involved

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all layers of the esophageal wall and were present to a lesser degree throughout the wall for some distance from the perforation. The esophageal perforation communicated with acutely inflamed and, in some areas, necrotic loose connective tissue of the mediastinum. This process led to acute aortic periarteritis and, in some areas, to acute panarteritis with necrosis of the entire aortic wall (Figure 4). Early atheromatous changes were also present in the aortic wall.

DISCUSSION

Barrie and Townrow[2] collected from the literature reports of 80 cases of perforation of the esophagus and aorta by a swallowed foreign body, and added a report of their own. In many of the cases the clinical features were such as those described by Chiari[3] in 1914—initial substernal pain, symptom-free interval of several days, "signal" hemorrhage, and fatal hemorrhage. The time interval between the esophageal perforation and death varied from five minutes to six weeks, with an average of approximately eight days. The "signal" hemorrhage preceded the fatal one by from two hours to three days, with an average of one day. Frequently pain recurred prior to the signal hemorrhage.

As to the mechanism of perforation of the aorta, Barrie and Townrow stressed the relationship between the character of the traumatizing object (blunt or sharp) and the time interval required for perforation. They expressed the opinion that sepsis does not play an important role. Pin prick perforation of the esophagus, resulting in infection with subsequent necrosis of the aortic wall and rupture due to internal pressure, was suggested by Watson-Williams.[8] Thrombosis of the vasa vasorum preceding necrosis with perforation of the aorta (as observed in carcinoma of the esophagus by Postoloff and Cannon[7]) may well play a role. No doubt, fatal

Figure 2.—Aorta. Microscopic section taken at point directly opposite arrow.

Figure 1.—Esophagus. The defect on the right has been extended. Note the hematoma.

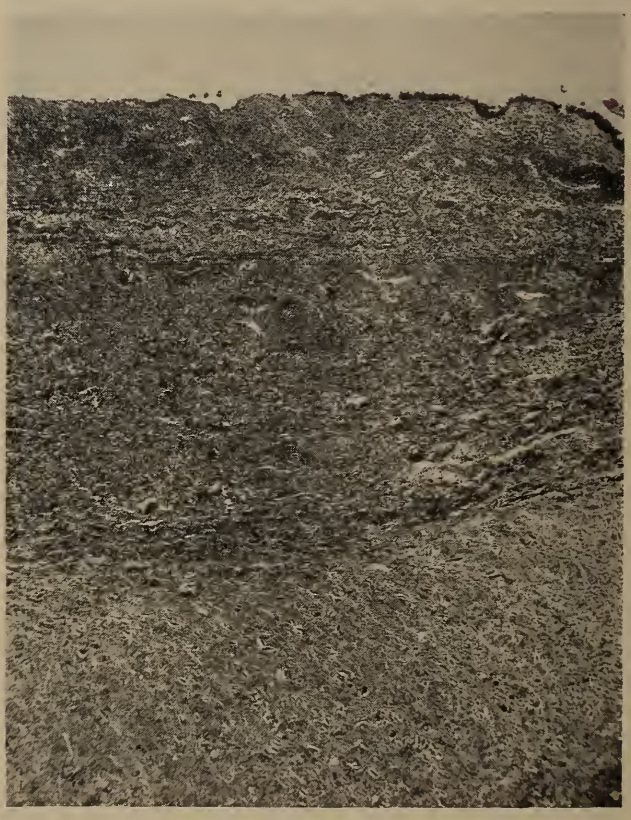

Figure 3.—Esophageal wall.

Figure 4.—Aorta. Note the heavy cellular infiltration extending throughout the aortic wall, adventitia (top) to intima (bottom).

hemorrhage may result from direct puncture of a vessel by an ingested object.[4] However, long-delayed hemorrhage as reported by Lascano and Senorans[6] is more compatible with their conclusion that the mechanism is erosion of the esophageal mucosa with subsequent abscess formation and finally aortic perforation following evacuation of the abscess.

Kraus (quoted by Barrie and Townrow) thought the formation of a perivascular clot arrested the initial hemorrhage but that progressive sepsis ruptured this clot, leading to further hemorrhage.

Probably any one or all of the mentioned mechanisms may apply in cases of this type. Since in cases of swallowed bone the offending foreign body is seldom found, it cannot be stated how much of the aortic lesion is due to continued trauma and how much is due to the secondary septic process with no initial direct trauma to the aorta. In the present case the process was probably one of acute localized esophagitis leading to acute mediastinitis and finally periarteritis and arteritis of the thoracic aorta with final weakening of the aortic wall to the point of rupture. No foreign body was recovered and probably the entire course of events was initiated by a superficial wound of the esophageal mucosa without the actual participation of the offending foreign body in the subsequent events. If the perforating object remained in the involved area, it might well be washed out by the gush of blood attendant upon aortic rupture.

Banks,[1] in discussing a similar case, stressed the importance of early esophagoscopy, a view with which the authors are in accord. However, since in several cases esophagoscopy revealed neither the foreign body nor the perforation, and since localized mediastinitis appears to be a major factor in producing aortic perforation with or without aortic-esophageal communication, vigorous chemotherapy is indicated, regardless of the endoscopic findings. Following the swallowing of a foreign body, sequential appearance of initial pain, symptom-free interval, and "signal" hemorrhage should call to mind this syndrome. Probably thoracotomy must be performed if the final fatal hemorrhage is to be prevented.

SUMMARY

A case of aortic-esophageal fistula with fatal hemorrhage secondary to swallowing a fishbone is presented, with clinical and pathological findings. A review of the pertinent literature suggests that localized mediastinitis following esophageal perforation is responsible for the establishment of the aortic-esophageal fistula. Vigorous chemotherapy is imperative even in the face of negative esophagoscopic findings. The sequential appearance of pain, symptom-free interval, and "signal" hemorrhage indicates aortic esophageal hemorrhage and heralds a fatal hemorrhage which may be prevented only by thoracotomy.

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Term Pregnancy Following Removal of Right Ovary and Left Corpus Luteum Cyst

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THE patient, a 29-year-old white gravida IV, para II, first observed January 10, 1949, reported irregular "spotting" since the last normal menses on September 5, 1948. She also had noted nausea, menstrual-like cramping, low backache, and a pain in the lower left quadrant of the abdomen.

In the three previous pregnancies there had been two normal deliveries at term (1942, 1944) and one spontaneous miscarriage at four months' gestation (1945). In 1945 an appendectomy and a right salpingo-oophorectomy had been done because of an "infection."

Physical findings were within normal limits. Blood pressure was 110 mm. of mercury systolic and 70 mm. diastolic. The uterus was gravid; gestation had progressed approximately two and a half months. There were no palpable adnexal masses. The cervix was bluish and intact. The

hemoglobin value in the blood was 69 per cent. Erythrocytes numbered 3,600,000 and leukocytes 8,200 with normal differential. The blood was Rh-positive, Group O. Result of a Wassermann test was negative. The urine was normal.

The patient continued doing housework, and remained pregnant. She was given iron, calcium and vitamins.

Three weeks later the patient was admitted to hospital in emergency, with complaint of severe cramping in the left side. There was no bleeding. The patient appeared acutely ill, but was not in shock. There was exquisite tenderness in the left adnexal region, where a soft, boggy mass approximately 6 cm. was palpated. This was thought to be either an unruptured ectopic pregnancy or a twisted ovarian cyst.

Under sodium pentothal anesthesia, a midline exploratory incision was made. The size of the uterus was approximately that of a three-month pregnancy, and it was pushed to the right by an ovarian cyst 6 to 8 cm. in diameter. This cyst was twisted 180 degrees upon its pedicle. There was no evidence of a right ovary or tube (previously removed). The cyst was shelled out of its capsule, and approximately one-half of the ovarian tissue was conserved. The pathological diagnosis was corpus luteum cyst. Recovery was uneventful and the patient was dismissed one week later.

For the duration of the pregnancy, increasing doses of stilbestrol were given. The patient complained of frequent cramping and nausea, but at no time was there any bleeding. On August 12, 1949, a normal eight-pound female was delivered by low forceps (used electively) after three hours of labor. Three days later the patient was dismissed from the hospital, afebrile and feeling well.

At examination six weeks postpartum, the uterus was well involuted and in anterior position. The left ovary was of normal size to palpation and was not tender. The cervix was cauterized because of hypertrophy with erosion. Although otherwise she felt well, the patient still complained of some left-side pain. A pyelogram was made; no evidence of disease in the kidneys or ureters was noted.

This case brings up the question of the actual necessity of the corpus luteum hormone in the first trimester of pregnancy. Bonn reported a case in which bilateral oophorectomy was carried out on the 35th day of gestation and pregnancy proceeded uneventfully to term. Hartman stated that, in the monkey, the corpus luteum of pregnancy may be removed as early as the 25th day of gestation without interrupting the pregnancy. Certainly, the answer is not yet known. In the case here reported, stilbestrol was given on the theory that stimulating the secretion of progesterone would reduce the risk of miscarriage. Whether or not the pregnancy would have proceeded to term without it is uncertain.

1304 Santa Rosa Street.

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Hepatitis and Nephrosis Due to Cough Syrup Containing Chloroform

CHARLES J. WALLACE, M.D., *Sacramento*

IT has been known for over 50 years that chloroform causes damage to the liver, kidneys, heart and nervous system. Instances of poisoning due to chloroform inhalation have been common in years past[1, 2] but clinical reports of chloroform poisoning by ingestion are rare[3] and none have appeared in the literature since 1933. Recently an extraordinary case of long-continued daily ingestion of chloroform was observed.

CASE REPORT

A 47-year-old salesman complained of anorexia, loss of libido and generalized weakness of one year's duration. The family history was non-contributory. There had been no major illnesses in the past and the only operation was for repair of a traumatically ruptured testicle during childhood. Chronic sinusitis and bronchitis had been present for 12 years, and several physicians had prescribed Cheracol.®* In traveling about the state the patient visited many physicians and requested prescription for Cheracol. Only the patient was aware of the amount of medicine he used. With some embarrassment, he admitted to an average daily ration of 12 ounces of Cheracol for the past ten years. On occasion, when a particularly bothersome upper respiratory infection occurred, he even increased the daily dose to about 20 ounces. With the 0.8 to 1.3 gm. of codeine thus ingested, the patient also took 1.6 to 2.6 gm. of chloroform daily. Other medication consisted of "One a Day" vitamin pills and occasional use of a penicillin spray. A diet survey revealed an average daily consumption of protein 50 gm., carbohydrate 80 gm., and fat 65 gm. In former years, the patient took one to two whiskey highballs before dinner, but during the past year he had discontinued this altogether because of feeling so "run down."

Upon physical examination the patient was noted to be well developed and well nourished. The weight was 171 pounds, the height 69¼ inches. The patient looked tired. The skin was pale and sallow but not icteric. There was a single spider angioma on the upper back. The odor of the breath was not remarkable. The eyes and ears were normal. The nasal and pharyngeal mucosae were slightly injected and swollen. The tongue appeared normal. Blood pressure, heart and lungs were normal. The abdomen was soft; a smooth, hard, non-tender liver edge extended 9.5 cm. below the xiphoid process and 5 cm. below the mid-clavicular line. The spleen could not be felt. The right testicle was about twice normal size. No abnormalities were noted in a rectal examination. There was no edema in the extremities. The reflexes were normal. Sensation was intact.

Laboratory data: Erythrocytes numbered 3,490,000 with hemoglobin (Dare) 11.0 gm. or 68.8 per cent, giving a color index of 1.0. There was moderate variation of size of red cells, with a moderate number of macrocytic cells. Reticulocytes made up 2.5 per cent of the total. Leukocytes numbered 8,950, with 69 per cent segmented neutrophils, 4 per cent non-segmented neutrophils, 3 per cent eosinophils, 1 per cent basophils, 25 per cent lymphocytes and 3 per cent monocytes. The pH of the urine was 4.0 and the specific gravity 1.018. There was a trace of albumin, no glucose. Many hyaline and granular casts were noted. A very few erythrocytes and leukocytes were observed. A second urine analysis confirmed the trace of albumin and casts. Results of a Kahn test of the blood and of stool examination were

*Each fluid ounce contains 1 grain of codeine phosphate, 2 grains of chloroform, 8 grains of potassium guaicolsulfonate, 8 grains of ammonium chloride, 1/12 grain of antimony and potassium tartrate, alcohol 3 per cent, and white pine and wild cherry bark.

Table 1

	January 20, 1949	March 16, 1949	May 21, 1949	July 19, 1949
Erythrocytes Hb.	3,490,000 11.0 gm.	4,050,000 11.6 gm.	4,580,000 14.1 gm.	4,940,000 15.0 gm.
Urine	Numerous hyaline and granular casts per hdf. Trace of albumin.	2 to 3 hyaline and granular casts per hdf. Trace of albumin.	No casts; albumin absent.	No casts; albumin absent.
Bromsulphalein Retention (30 minutes)	14.2 per cent	10.75 per cent	5.5 per cent	5.0 per cent

negative. In a determination of bromsulphalein excretion, using 5 mg. of dye per kilogram of body weight, 14.2 per cent of the substance was retained 30 minutes after administration. The icteric index was 8.8 units. There was 0.85 mg. of total bilirubin per 100 cc. of serum; 47 per cent of it was direct-reacting. Results of two Hanger flocculation tests were normal. Fasting blood urea was 13.4 mg. per 100 cc. The fasting gastric juice contained 14 clinical degrees of free acid. The basal metabolic rate was minus 8. An electrocardiogram was normal. Data of subsequent laboratory procedures during treatment are outlined in Table 1.

Treatment consisted of discontinuing cough syrup and, for a period, substituting codeine tablets, 30 mg. four times a day, and finally stopping these as well. The diet was adjusted to provide protein 90 gm., carbohydrate 200 gm. and fat 75 gm., a total of about 1,800 calories. The patient was permitted to remain ambulatory, but ten hours of sleep per day was recommended.

During the succeeding months, the patient regained normal appetite, strength and libido. Six months after discontinuance of the medicine and institution of the dietary regimen, the patient felt perfectly well; the color of the skin was normal, the spider angioma was gone, and the liver had diminished in size by 2.5 cm. The return of abnormal laboratory findings to normal is shown in Table 1.

SUMMARY

An extraordinary example of chloroform poisoning producing hepatitis and nephrosis is presented. Response to withdrawal of the offending agent and adjustment of the diet to guarantee high protein and vitamin content was gratifying.

2615 Eye Street.

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California MEDICINE

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EDITORIAL

The Doctor Draft

Now that Congress has passed the "doctor draft" bill, medicine can hope for an orderly and equitable solution to the question of who goes first in time of war. Heretofore the question remained unasked and unanswered until emergency was fully upon us and hasty steps had to be taken to solve it.

The bill adopted by the Congress appears to meet with almost complete approval by doctors all over the country. Even before the measure was introduced in the form of legislation, physicians were discussing the advisability of setting up priority classifications where medical officers were needed. As adopted, the bill seems to meet with the popular thinking in medical circles.

There is still much to be learned as to how this measure will work out in actual practice. Selective Service, which is guided by the needs and wishes of the military, must make and interpret numerous regulations. The Army, Navy and Air Force must determine just what their respective needs are and how they may best be met. While these processes are going on, the doctor who may be covered by the law is left in doubt as to his own status. Is the veteran of the Army of the United States still in a reserve status? Is the Navy reserve officer still in reserve? Has the Army terminated its five-year reserve commissions automatically? Is an actual resignation required for a reserve officer to be separated from the reserve?

These are some of the questions which were asked at the recent San Francisco regional meeting of the Council on Emergency Medical Service including top military and Selective Service representatives. Some of them called for technical answers which left just as much confusion in many minds as there had been before. Others brought forth replies which at best could be considered contradictory. The one positive statement that stood out in many minds was the speculation by one military leader that from this time forward every physician should plan to absent himself from his practice for *two* periods of military service. This statement seems as realistic as it is shocking. Present world affairs would indicate the truth of such a conjecture.

In view of this approach to the medical profession by a high-ranking military officer, is it too much to ask that the military services adopt a realistic attitude in their own tables of organization and their use of medical personnel? Many suggestions come to mind and a few might bear investigation.

In the first place, do the military forces need as many physicians as they demand, even in time of war? In the last war, one out of every three physicians was called to duty, a far greater percentage than any other professional, business or working group in the country was called upon to furnish. In many instances these men waited interminably, assigned to specific units which took months to build up. Professionally these doctors got rusty; socially they got bored; economically they got deprived of their normal standard of living while serving as so many "bodies" in a table of organization. Wouldn't it have been better to have had pools of available physicians for assignment to the various theaters of war and to draw upon these pools as medical officers were needed?

Another cause of discord in the medical forces was the overstaffing of many hospitals and dispensaries, resulting in a minimum of work and a maximum of record-keeping and other clerical tasks. A

good corps of non-commissioned and warrant officers could have handled a lot of the paper work and left the doctors free to practice medicine.

Right now we find the Army and Navy treating Veterans Administration patients, as well as dependents of service men. These patients could be cared for by civilian doctors at less cost and with greater convenience to the patient and greater efficiency to the medical corps of the services.

These are a few of the things which might stand a little looking over and a little overhauling. There are others but these stand out as roadblocks in the way of efficient military medical services, in time of war or peace. It would seem that a concerted drive to eliminate these barriers would make the services more attractive to doctors and less disruptive to civilian medical practice.

These criticisms are not new. They have been voiced time and again by civilian doctors who gave up their own careers to serve in the wars in which this country has been engaged. They have been placed before the military leaders for consideration; and, no doubt, some progress has been made in ironing out some of the more noticeable defects. However, in view of the present demand for doctors in what is apparently destined to be a large defense establishment, it looks as though the defense authorities might augment their efforts to clean out the sore spots and make their services more attractive. Medicine has always answered the call, even in numbers out of all proportion to other walks of life; medicine should have some opportunity to ask for a greater efficiency as a means of making the country's medical assets cover the greatest possible ground. That's not too much to ask.

C.M.A. Special Session Cancelled

Several months ago the Council of the California Medical Association voted to schedule a special session of the House of Delegates and selected Sacramento as the site, December 2 and 3 as the dates. At that time it appeared that several items were important enough to warrant the holding of a special meeting for the purpose of discussion as a committee of the whole.

More recently it became apparent that the anticipated discussions were not of such great import as had originally been calculated. Accordingly, the Council decided to cancel the proposed meeting as a means of saving the time, energy and expense involved.

Plans for the Annual Session, to be held in Los Angeles next May 13-16, will permit ample time for the handling of all problems to come before the House of Delegates. Meanwhile, the effort of the December meeting will be eliminated.

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Special Announcement

REGARDING C. M. A. ANNUAL MEETING

To All Members:

The 1951 Annual Session will be held in Los Angeles, Sunday, May 13, to Wednesday, May 16, inclusive. Limited facilities will be available for MOTION PICTURES. If you would like to exhibit send your application to Dr. A. E. Smith, 1930 Wilshire Boulevard, Los Angeles.

PAPERS should be submitted for consideration to the appropriate section secretary (see list on this page).

There will be limited space available for SCIENTIFIC EXHIBITS. If you would like to apply for space, please write immediately to the office of the Association for application blanks. Please indicate space requirements. No exhibit shown in 1950, and no individual who had an exhibit at the 1950 session will be eligible until 1952. No requests for space will be considered after DECEMBER 1, 1950.

All applications for space or program should be transmitted as soon as possible: The deadline is DECEMBER 1, 1950.

ALBERT C. DANIELS, M.D.
Chairman, Committee on Scientific Work

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Information for Authors, Members of Symposia and Panel Discussions

1. Members are reminded that each lantern slide takes approximately one minute for presentation and that *no lantern slide should have more than six lines of text* on it. The interest of the audience is better held by succinct presentation of the principal points.

2. Extra time is *not* allowed for the presentation of slides, movies or other material, except by special arrangement with the section officers *prior to completion of the program.* (Program deadline: *February 1, 1951.*)

3. Authors *must* inform section secretaries *and the Office of the C.M.A.* well in advance of the meeting of any special equipment needed for presentation of papers other than standard lanterns (3½- by 4¼-inch glass slides).

4. The program goes to press in *February.*

MANUSCRIPT INFORMATION

1. All papers are the property of the California Medical Association unless officially released upon *written request* by the author to the Editor of CALIFORNIA MEDICINE.

2. All manuscripts should be submitted in duplicate.

(a) One copy of the manuscript accompanied by an abstract written in *lay language* must be in the office of CALIFORNIA MEDICINE, 450 Sutter Street, San Francisco, at least six weeks prior to the meeting (*by March 31*). This copy will be used to prepare advance material for the press.

(b) Every speaker taking part in the Annual Session should have his final manuscript completed for presentation to the section secretary at the time of delivery of the paper. It should be in proper form for consideration by the Editorial Board of CALIFORNIA MEDICINE.

3. All references must be numbered in alphabetical order, keyed into the text, and in the Table of References must be listed in numerical alphabetical order. (For example: 1. Adams, etc. 2. Brown, etc. 3. Charles, etc. 4. Davis, etc.)

References should follow the style used by the Quarterly Cumulative Index Medicus which is followed by CALIFORNIA MEDICINE: Author's name or names, *Title of the article,* volume and page, *date of publication, including month* and day (if given).

Example:

1. Adams, J., and Smith, J. J.: etc.

2. Brown, J. B., and Fryer, M. P.: Major defects of the face and their surgical repair, Postgrad. Med., 4:420-434, Nov. 1948.

3. Davis, J.: etc.

Industrial Fee Schedule

Summary of the report made by the C.M.A. Industrial Fee Schedule Committee to the Council of the C.M.A., September 9, 1950.

A meeting of the Negotiating Committee and its Advisory Committee was held at the Sir Francis Drake Hotel on January 25, 1950. A general principle was adopted that industrial fees should be based upon a fair rate for effort expended. This does not imply that an industrial case should be handled at a fee lower than one compatible with the cost of ordinary practice. The basic cost of operation of a medical practice has increased as the cost of living has increased in the United States, and there has not been a comparable increase in the fees paid for the care of an industrial patient during the past 20 years. We felt that the whole concept of a fee schedule should be reviewed and reevaluated.

Before entering into any discussion of individual fees, it was felt that the basic relationships between doctors and insurance carriers should be reviewed, and an attempt made to create a closer association between the two groups. The average doctor does not understand the provisions of the California Workmen's Compensation Law as it applies to the practice of medicine and surgery. A summary of the provisions of that law is outlined as follows for the information of doctors who are engaged in practice of this type.

1. *Duty of Employer to Furnish Medical Care:*

Labor Code, Sec. 4600, provides that medical care and hospital treatment "reasonably required to cure or relieve" from the effects of any industrial injury "shall be provided by the employer." The section further provides that in case of the employer's refusal or neglect to provide medical care, the employee may obtain same at the employer's expense. For practical purposes, compensation insurance carriers take over by virtue of their insurance contracts the duty of the employer to furnish medical care, and hence it is the compensation carrier that actually selects and employs the physician.

2. *Provisions Regarding Free Choice:*

Labor Code, Sec. 4600, above summarized, does not provide for any free choice of physician, but on the contrary places the duty on the employer (insurance carrier) to provide both medical and hospital care. *Labor Code, Sec. 4601,* specifies that if the employee requests, "the employer shall tender him one change of physician and shall nominate at least three additional practicing physicians competent to treat the particular case . . . from among whom the employee may choose." *Sec. 4601* specifies that the employee in "any serious case" is entitled to the services of a consulting physician "provided by the employer."

In other words, under our Workmen's Compensation law, free choice of physician is non-existent except for the right of an employee to demand a panel of three from which to choose. In the absence of an employee demand, he must accept the physician selected by the carrier. Even this very limited free choice is further restricted by *Labor Code, Sec. 4603,* that provides that in those instances where the employer maintains for his own employees a hospital and "hospital staff" the employees must accept the physicians on the hospital staff without any right to demand any change.

3. *Selection of Physician by Employee:*

If an employee does exercise his right of free choice and selects a physician other than the ones designated by the insurance carrier, then the services of the physician selected by the employee are at the employee's own expense (*Labor Code, Sec. 4605*).

4. *Medical Examinations:*

The *Labor Code* (*Secs. 4050-4052*) also provides that whenever there has been an industrial injury, the employer (insurance carrier) may require the employee to submit to an examination by a physician selected by the employer, or to an examination by a physician selected by the Industrial Accident Commission or any referee. *Labor Code, Sec. 4055,* provides that any physician who makes an examination, either on behalf of an insurance carrier or the commission or the referee, may be required to report or testify as to the results thereof.

5. *Compensation of Physicians:*

Labor Code, Sec. 5304, provides that whenever there is a dispute between a physician and an employer or insurance carrier with respect to the fees payable for services rendered, the Industrial Accident Commission shall have jurisdiction to settle the controversy "unless an express agreement fixing the amounts to be paid for medical, surgical or hospital treatment . . . has been made between the persons or institutions rendering such treatment and the employer or insurer." In other words, if there is an express agreement between an insurance carrier and a physician, the terms of the agreement control; in the absence of an express agreement, the physician may file a claim with the Industrial Accident Commission, whereupon the commission or a referee, after hearing, may fix the amount payable. In determining controversies between physicians and employers or insurance carriers, the Industrial Accident Commission, or its referees *are not* bound by any particular fee schedule. The law merely provides that the commission, acting as a court, may adjudicate the controversy, and it may apply any fee standard that it sees fit.

6. *Fee Schedules:*

Almost continuously since about 1913 the Industrial Accident Commission has maintained a minimum fee schedule for medical services. These fee schedules have been based on the following legal principle: That the commission has the right to adopt reasonable rules of practice and procedure (*Labor Code, Sec. 5307*); that it has jurisdiction to settle controversies between physicians and insurance carriers over fees (*Labor Code, Sec. 5304*); and that in the exercise of its power to settle controversies it may, under its power to adopt rules of practice, establish a minimum fee schedule as a rule of practice for the *guidance* of its referees. Hence, all minimum fee schedules of the Industrial Accident Commission have been and are merely "rules of practice" for the guidance of referees and the commission itself. There is no provision in our California Compensation Law specifically authorizing or directing the establishment of a medical fee schedule, either minimum or maximum, that would be in and of itself binding in all cases upon everyone concerned. However, as a matter of custom, the Industrial Accident Commission's minimum fee schedules have been adhered to in the main by both insurance carriers and physicians, for the reason that in a disputed case it can be assumed that neither the commission nor a referee would award to a physician a fee below the commission's own minimum schedule.

* * *

The Negotiating Committee of the C.M.A. and the Negotiating Committee of the insurance carriers met in San Francisco on August 24, 1950. The matter of a broad educational program directed towards improving relationships between the medical profession and the insurance carriers was discussed at length. It is planned that a basic outline of instructions is to be published outlining the duties of the attending physician to the insurance carrier, and it is hoped that when this outline is made available some of the criticism on the part of the insurance carriers can be obviated.

Criticism was directed against insurance carriers also, and they have agreed to try to simplify some of their reports in an effort to promote an easier and more simple method of controlling medical care. The insurance carriers have agreed to make a serious effort to condense all reports from all insurance carriers to a single acceptable outline form

and thereby eliminate a good deal of unnecessary secretarial work on the part of the doctors making those reports. A move of this type is surprisingly difficult, and will require time to accomplish. There has been a considerable amount of correspondence regarding the subject of fees to be paid for multiple procedures. The bulk of this correspondence has to do with the practice of charging as separate items an office visit and the injection of penicillin. The attitude of some of the carriers was to the effect that no surcharge was to be paid for the injection of penicillin, and others agreed that the surcharge would be paid on the basis of 50 per cent. They base this compromise decision on Paragraph 5 of the 1950 schedule, which states, "Multiple injuries treated by one physician are to be billed at the greatest fee plus one-half of the fee for the other items." It is our impression that this latter compromise figure will be acceptable to the majority of the insurance carriers billed in that fashion.

The third paragraph of the 1950 schedule, which reads, "To avoid duplication of services when all the required care for a case reasonably falls within the range of qualifications of one physician, no other may claim a fee," was criticized by the doctors. To our amazement, the insurance carriers felt that this paragraph had been most efficacious in eliminating a practice of certain doctors making unwarranted and unnecessary visits to industrial patients. As the insurance carriers bluntly put it, they do not care to be billed for the same thing by two different doctors. They very definitely made it clear that they would never object to the care furnished by two physicians where this care is indicated or necessary. They definitely stated that when medical charges in excess of the schedule are submitted, the insurance company certainly has a right to a reasonable explanation of these excess charges. If a bill of this type includes a reasonable and adequate explanation, insurance carriers are certain it will be given reasonable consideration.

Further meetings of the Advisory Committee of the C.M.A. and of the Negotiating Committee are planned for the immediate future. A revision of a schedule of fees is not going to be simple, nor is it going to be accomplished in any short period of time. We are hopeful that we can, by mutual education of doctors and insurance carriers, arrive at a plan of mutual understanding regarding fees in general. This is the aim of your present committee, and we would appreciate the support and good will of the practicing physicians in the state of California towards accomplishing this end.

FRANK J. COX, M.D., *Chairman*

The California Physician and Civil Defense

JUSTIN J. STEIN, M.D., *Los Angeles*

Chairman, Committee on Emergency Medical Service, California Medical Association; Member, Radiological Safety Advisory Committee; Chairman, Citizens Advisory Committee, Medical and Public Health Services, California Disaster Council

Success in modern war requires total national mobilization of labor, industry, and personnel from the very first intimation of war. We have been indirectly at war for many months, and any hour, day, or month may see the full scale outbreak of hostilities on our own cities, and certainly in the California area. Every nation is vulnerable to attack by a powerful enemy, for a defense against attack is seldom perfect.

Mr. Paul Larsen, director, Office of Civilian Mobilization, has defined civil defense as follows:

"Civil defense may be defined briefly as the defense of the home front by civilians and civil authority in time of war. It is largely, but not wholly, passive defense.

"For better understanding of the term it is essential to examine in more detail the measures to be employed by civilians and civil authority in their defense of the home front. By so doing, a better appreciation can be had of the importance of civil defense in the total mobilization picture.

"For planning purposes, we have divided the necessary civil defense measures into four groups:

"(1) Measures to avert an enemy attack, such as camouflage, blackouts, aircraft observer systems, and similar quasi-military activities in which civilians may be called upon to assist.

"(2) Advance measures for minimizing the effects of any enemy attack, including such measures as civil air raid warning, the dispersion and relocation of facilities, and the prior evacuation of children and personnel not essential to the war effort.

"(3) Measures to alleviate, control, and repair the damages resulting from enemy attack, ranging from medical and health services, decontamination, and fire fighting, to the removal of debris and salvage.

"(4) And, in connection with the foregoing measures, a group of over-all measures which we

Read in part before the Citizens Medical Advisory Committee to the California Disaster Council, Sacramento, California, July 11, 1950.

term 'general considerations,' such as research and development, legislation, organization, training, policy guidance, military support, and civil defense requirements."[1]

CURRENT CIVIL DEFENSE PLANNING

The summation statement on current civil defense planning, by Paul J. Larsen, at a hearing before the Joint Committee on Atomic Energy, March 30, 1950, is as follows:

"In summation, it can be said that the over-all planning has been basic in order to round out a complete civil defense plan from the Federal Government standpoint, the implementation of which will be the responsibility of the states and local community organizations. Our planning in respect to this Federal Plan has differed from other nations' planning, basically because of our governmental structure and the belief that civil defense operations must be maintained on the basis of our democratic system of government.

"It is our belief that the responsibility of the Federal Government in civil defense activities even after implementation will not require the establishment of a large federal organization in order to insure adequate civil defense to overcome disaster which may occur by enemy action. The federal agency for civil defense will be basically responsible prior to mobilization for (1) formalizing a federal plan which will be accepted by states and local communities, (2) assisting states and local communities in training of volunteer workers, (3) establishing national schools for training of key state and community civil defense personnel, (4) evaluating requirements of equipment and resources for civil defense and determining which of these should be obligations of the Federal Government and/or state and local communities, (5) evaluating weapons effects in order to determine sound dispersion and evacuation policies of government activities and/or other vital installations, (6) maintaining such reserve stores of critical materials as will be required in event of disaster, plus control and distribution of these to communities requiring them in the event of disaster, and (7) maintaining close liaison with the public and public groups through the medium of information, public relations and education on civil defense planning and the dangers which the public should prepare for without introducing hysteria or fear which would affect morale and effective civilian participation in the civil defense program and the public's main functions of maintaining activity at top level for the war effort.

"The national plan can in our estimation be implemented by the states and local communities for the present without necessity for federal civil defense legislation beyond that now existing in the National Security Act of 1947. Additional legislation will be requested when appropriate, in order that the Federal Government can implement its planning, training, and operation program in order to establish supplies for emergency uses and to establish an operating federal organization."[2]

We are therefore dependent upon the National Security Resources Board to present us with an over-all civil defense plan and with proper estimates of the military situation when such estimates are available. The National Security Resources Board will furnish each state with an over-all plan for civil defense in September 1950. This will not be a blueprint, and only basic fundamental suggestions will be made.

WAR AND PEACE-TIME DISASTERS

Differentiation must be made between major disasters occurring in peace-time and those occurring in time of war. For example, in peace-time, major disasters, such as earthquakes, fires, etc., will be handled differently. In peace-time, reserve officers, military personnel and supplies can effectively be utilized, whereas in time of war no military personnel or supplies can be utilized without due regard to the military situation. When plans call for the use of reserve officers and military supplies they should be made with the full realization that the military area commander may prohibit their use because of the existing military situation. It is interesting to note that to date the majority of individuals in California who profess any interest in civil defense are those who witnessed great destruction during World War II in Europe and the South Pacific, and who know that such tragic destruction can very well take place in our cities if we adopt a do-nothing attitude. We cannot stick our heads in the sand like an ostrich and ignore what is happening around us.

TRAGIC MISTAKES BY GERMANY AND JAPAN

The Germans in World War II were repeatedly assured by Goering and others that they had nothing to fear from the standpoint of air bombings. The German cities would be completely protected by the German Air Force. Consequently, very little was done about civil defense planning and organization. The lack of civil defense planning in Germany was disastrous, and when it was begun it was too late. There were 422,000 German civilian deaths, nearly three-fourths of which occurred in the last two years of combat. The number of injured is unknown.[3] Bombing in itself did not result in or foster epidemics there. The Germans, being well trained in personal hygiene, were a bulwark against the breakdown of public health as their cities were being destroyed by the enemy. The Germans had a well organized system for the control, manufacture, and distribution of essential medical supplies.[4] However, they delayed too long in putting their program into effect, and in the curtailment of the numbers and types of dressings, drugs, and of equipment used. One of the first things we must do in the United States is to standardize as much as possible the treatment for various types of injuries and particularly the treatment of burns. Since the percentage of injury by burns will be very high, it can readily be seen that the indiscriminate use of dressings, antibiotics, and blood or plasma would soon deplete the stock-piles unless control is instituted.

In some German cities where civil defense measures were well organized, bombings did not result in complete community disorganization, as was the case in cities where civil defense was not well planned. This was brought out in the comparison of the cities of Duisburg and Hanau. Duisburg was exposed to air raids early in 1941, and a competent and well organized civil defense system gradually grew up in that community. As a result, the casualties were small and essential work was effectively maintained during the period of intense bombings in 1943 and 1944. Hanau, on the other hand, felt that it was too small and unimportant industrially to be a target for heavy air raids, and civil defense plans were not taken very seriously. When a large air raid did occur in December 1944, the Hanau population was panic-stricken and fled the city without organization or plan. Within one night this community of 43,000 people became a mass of ruins, with only five or six thousand people left, and it has never recovered from this disaster.[5]

In Japan these was inadequate planning and organization for civil defense and, again, too late in the war. Many of the casualties from both conventional bombings and from the atomic bombings would have been saved by improved civil defense and first aid measures. Burn cases were very poorly treated and under extremely unhygienic conditions in some areas.

ENGLISH PLANS FOR CIVIL DEFENSE

The English had begun to plan for civil defense in 1935, and an effective highly organized program was well in effect during the early stages of the war. The personnel of civil defense services there reached a peak of 1,900,000 (71.0 per cent males). From a peak of 390,000 full-time males (20 per cent of the total) the number consistently diminished each year after 1941, and the duties of full-time male personnel were assumed by part-time male and female personnel in ever-increasing numbers to June 1944.[6]

Military casualties had to be transported to England from the Continent and treated, medical transport had to be increased, civilian casualties dealt with, and industrial workers under stress kept well and productive.[7] The collection, transport, and first-aid treatment in hospitals of casualties provided excellent lessons for dealing with peace-time accidents and other disasters. Casualties from September 3, 1939, to August 14, 1945, listed by governmental reports, were:

	Killed	Wounded	Total	Ratio Wounded to Killed
Total	357,116	369,267	726,383	1:0.97
Armed Forces	264,443	277,077	541,520	1:0.95
Civilians	60,595	86,182	146,777	1:0.70
Women's Services, Home Guard, Merchant Navy and Fishing Fleets	32,078*	6,008	38,086	1:5.3

*93 per cent in Merchant Navy and Fishing Fleets.

Of the total identified civilians killed, 44 per cent were men, 42 per cent women, and 12 per cent children under 16 years of age. Only 3.9 per cent of the killed and 5.2 per cent of the wounded were civil defense workers on duty. When these figures are contrasted with those from Germany, the excellent results of good civil defense planning are readily apparent.[6]

With only a few minutes' warning a civilian population with an adequate civil defense organization can sustain atomic bombings or conventional air bombings with greatly diminished numbers of casualties. Only a few minutes is required to alert the civil defense organization, for persons to turn off gas, put out hearth fires, and seek shelter.

There have been reports of instances in which persons in Japan saw the atomic bomb coming, immediately took shelter not far distant from the center of the bomb impact, and survived uninjured.

MEDICAL PLANS FOR CIVIL DEFENSE AND MAJOR DISASTER

All local communities should proceed at once to set up a flexible plan which can readily be adapted to any over-all general plan. Even if a general over-all plan is set up, it too will have to be flexible and subject to continuous changes depending upon estimates of the situation.

WHAT CAN THE COUNTY MEDICAL GROUPS DO?

The great success of the civil defense plans in England was the effective efficient working of plans on the local or community levels. The same will be true in future wars. No matter what the national plan, certain fundamental steps must be taken on the local level.

Each county medical group of an appreciable size, and smaller county medical groups, should combine, and appoint at once a committee for civil defense and major disaster. These committees should then do the following:

1. Provide for the procurement and assignment of medical personnel.

The civilian needs for physician services in the next war will be great, probably as great as or greater than the military needs. For this reason attempts should be made to determine the minimum number of physicians required for communities of certain size, taking into account their strategic location. As many combat medical veterans as possible should be retained for the civilian defense set-up. They have been under fire, know how they will react to the initial hysteria, and have been fully indoctrinated into the importance of collection and evacuation of casualties, first-aid measures, treatment of burns, importance of good records, etc. The utilization of medical personnel by the Armed Forces during World War II was very inefficient in numerous instances. *The organized medical profession should at once crystallize its opinions regarding the assignment and procurement of physicians and*

make its recommendations known to the proper authorities. The ordering to active duty of large numbers of physicians when they are not needed is highly demoralizing and poor planning. The civilian medical requirements will be very great in strategic areas such as the San Francisco, Los Angeles, and San Diego areas. These regions have been designated by the National Security Resources Board as probable target areas in California. The organized medical profession must take the initiative in all medical civil defense problems and, as stated above, immediately make known to the Armed Forces its views regarding the procurement and assignment of medical personnel.

Every member of the county medical society or association should be given a certain assignment, and a double check should be made to see that he has not been given too many assignments. If he is on several hospital staffs he should select the one nearest to his home or office and have his name listed for the one assignment plus an alternate assignment in the event he cannot, for some unforeseen reason, go to his original assignment. Female physicians should, of course, be completely incorporated into any medical plan. Disaster identification cards should be given to each physician by his local civil defense committee.

When the assignments are made the reserve status and availability of the physician should be kept in mind.

2. Teams should be organized, teams labeled in accord with their duties: Casualty collecting, blood and blood derivatives, shock, psychiatric and psychologic, radiation casualty, burn, general surgical, maxillofacial, thoracic, vascular, neurosurgical, epidemiological, orthopedic, first-aid, etc.

3. Uniform methods of treatment should be worked out, as much as possible, for burns, radiation injuries, and orthopedic casualties. Many of the casualties will have burn and orthopedic injuries. Supplies should be used sparingly.

4. A simple method of keeping records of all casualties should be established.

5. The number of hospital beds available in the area should be listed: (a) The number of hospital beds in regular use. (b) The number of hospital beds which can be made available for emergency use. (c) The number, capacity, and type of emergency aid stations. (d) Convalescent home facilities, if any. (e) The number of schools, medical buildings and offices, and stores which can be used for aid stations and temporary housing of injured or displaced persons.

6. A survey should be made of transportation available to transport patients or casualties—motor ambulances, motor trucks, motor buses, etc. The number of splints, litters, blankets, and aid kits available should be determined.

It may be necessary to evacuate hospitals or aid stations to other areas.

7. Inventory should be taken of medical supplies in the area concerned, their availability, amount required for normal use. Sources for making up shortages should be listed, and the time required to obtain replacement should be determined.

It would be extremely foolish to stock-pile supplies, such as blood, for example, which is good for only about three weeks. Also the stock-piles, if located in congested areas, could be easily destroyed. It may be necessary to have secret stock-piles to prevent destruction by sabotage.

The types of supplies should be listed as follows: (1) Surgical dressings and bandages. (2) Drugs, biologicals, and antibiotics. (3) Blood and blood derivatives. (4) Surgical instruments and equipment. (5) X-ray supplies and location of x-ray units. Many casualties will require roentgenographic examinations, and outlying offices with x-ray equipment can be used for this purpose for ambulatory casualties. (6) Laboratory supplies. (7) Miscellaneous hospital and medical supplies.

This inventory must include supplies required by hospitals as well as non-hospital supplies.

8. Every hospital should be encouraged to set up a standard operating plan for civil defense and major disaster. Such a plan to prepare for: (1) Evacuation of patients, if necessary. (2) Expansion of present bed facilities on short notice. (3) Selection of alternate hospitals to evacuate to, if necessary. As a part of that plan, the number, location, and capacity of convalescent homes, if any, in the area should be noted. A list should be made of all trained laboratory personnel, registered nurses, practical nurses, nurses' aides, and others who could be immediately called to duty.

SPECIAL PROBLEMS FOR CIVIL DEFENSE

Special problems for civil defense have been considered by the National Security Resources Board[2] as follows:

"*Blood and Blood Derivatives:*

"It has been estimated that several million pints (or units) of blood might be needed within the first few weeks of an attack on our civilian population. Provision of large quantities of this indispensable life-saving item presents some unique problems which arise from the fact that under proper refrigeration, whole blood can be preserved for only three or four weeks.

"Intensive research on methods to extend this period is being conducted, but until it is successful we must base our plans on present limitations. It would be extremely wasteful and probably impossible to maintain a three-week stock-pile of such proportions. Plasma can be kept for several years but, although it is useful in the treatment of shock, it is by no means a complete substitute for whole blood.

"Therefore, the only recourse is a highly efficient organization, including a huge reserve of standard bottles and other supplies, ready to carry out mass

blood procurement from persons outside the attacked area.

"It is entirely possible to devise, on paper, an organization which could recruit millions of blood donors within a period of one to several days. But this is a highly technical operation which produces a commodity that can be lethal unless it is collected and transfused with strict conformity to complex safety standards.

"To activate an adequate and safe war-time blood program without previous, extensive, actual experience in peace-time would be virtually impossible. If an efficient integrated, nationwide peace-time blood program could be organized, it would answer an immense and vital peace-time need and also would offer a strong foundation on which an expanded war-time program could be built with relative ease, safety, and speed. Standardization of equipment is imperative and, in addition, great efforts must be made to extend the period in which whole blood can be preserved and to develop more effective blood substitutes.

"The NSRB, therefore, is initiating a series of conferences between the various interested agencies in order to solve these problems and to plan a blood program which will be adequate for war-time civilian and military needs.

"*Standardization of Supplies for Treatment of Burns.*

"One of the most common types of casualties in civilian war-time disasters is burns. Even before the advent of the atomic bomb, fire raids such as those on Hamburg and Tokyo resulted in enormous numbers of burn casualties. Based on Hiroshima experiences, about 60 per cent of atomic bomb casualties would be burn cases, with or without other accompanying injuries or radiation sickness. It is well known that burns require an extraordinarily large amount of nursing care and supplies. The multiplicity of methods of treatment for burns makes it essential that if reserves of health supplies are developed they must conform to the needs of one uniform system of treatment. We therefore are concentrating a great deal of attention on the development of a method of treatment which would be medically sound and effective and, at the same time, practical for use in large disasters."

SPECIAL TRAINING BY NSRB

Courses to train physicians, nurses, and dentists in the treatment of radiation casualties have already started. Also, courses in radiological monitoring for instruction in the problems of radiological contamination of food, water, and environment in both peace-time and war-time.

A suggested plan of organization of active staff members for hospitals of 50-bed capacity or more for emergency service is as follows:

1. An administrative and evacuation committee. This committee to direct all activities in the hospital and to have charge of evacuation of all patients in the hospital to make room for casualties.

2. Admitting and receiving committee. This committee will admit casualties when necessary, make records of their injuries, and refer to appropriate departments in the hospital.

3. Emergency out-patient committee. All cases needing only emergency out-patient care, as determined by the admitting department, will be treated by this group.

4. Laboratory committee. Emergency blood transfusions, blood counts, etc., will be supervised by this group.

5. Surgical teams to be formed, the number depending upon the size of the hospital staff, and provisions made for their relief.

6. Consultation teams, composed of representatives of the various specialties, such as neurosurgery, orthopedic surgery, urology, radiology, eye, ear, nose and throat, etc., to be available for their services as needed. Special teams for burn cases and radiation injuries should be formed.

7. Hospital care committee. This group to be composed of various specialists and general practitioners to carry out treatment and supervise hospital care of casualties admitted in cooperation with the surgical and consultation teams.

8. First aid teams. Groups of first aid teams can be formed to go out with ambulances to points of disaster to render first aid and determine which patients require hospitalization.

9. Physical hospital committee. Nursing, housekeeping, pharmacy, engineering, laundry, and dietary problems to be supervised by this committee. This committee will plan for the procurement, storage, issue, replenishment, repair and maintenance of hospital plant facilities, medical equipment and supplies, patients' food supplies, and medical transportation.

THE C.M.A. EMERGENCY MEDICAL SERVICE COMMITTEE

1. This committee will encourage and assist wherever possible the local county medical groups in their planning for civil defense and major disaster. Suggestions have been made to that end in this paper. The medical profession must take the initiative and have workable plans. We shall not wait for some government agency to do it for us.

2. The California Medical Association is represented on the Medical Advisory Committee of the Disaster Council for the State of California and on the Radiological Safety Advisory Committee.

3. This committee will help coordinate the medical activities of the local county medical groups and the C.M.A. with that of volunteer agencies, city and state health departments, the military, and the National Security Resources Board.

4. As quickly as it is received, any information of value regarding civil defense will be passed on to the local county medical civil defense committees. An enlightened medical profession and public will always react more favorably in the event of a crisis.

5. We must justify the public confidence, as physicians have always done in the past, by consistently increasing our knowledge of the care and maintenance of the sick and injured in the event of enemy attacks.

LEGISLATION FOR CIVIL DEFENSE IN CALIFORNIA

California has a disaster act[8] which was amended at the 1945 session of the Legislature. Article 1, paragraph 1500, reads as follows:

"The State has long recognized its responsibility to provide for preparedness against disasters that may result from such calamities as flood, fire, earthquake, pestilence, war, sabotage and riot. It is hereby found and declared that it is necessary, to enable the State to more effectively join with political subdivisions, municipal corporations and other public agencies of the State, in preparing to cope with and guard against conditions which may result in extreme peril to life, property and the resources of the State and generally to protect the health and safety and preserve the lives and property of the people of the State, and in times when the United States of America is engaged in war, to assist the Federal Government in the successful prosecution thereof, that a readjustment of the provisions of law for dealing with such hazards be accomplished in the light of war-time experience, and that advantage be taken of those implements and methods, organizations and arrangements that have already been developed to deal with possible future disasters."

Article 3, paragraph 1520, entitled Citizens' Advisory Committees, is as follows:

"The Governor may create advisory committees to assist in specific fields of civilian protection, war services and disaster preparedness. He shall appoint members thereof and they shall serve at his pleasure. He shall also designate the chairman and vice-chairman thereof. The committees shall be under the direction of the Governor or such State department head as he shall designate, and shall be wholly advisory in character and shall not be delegated any administrative authority or responsibility. Members of such committees shall not receive compensation from the State for their services under this chapter, but when called into conference or session by the Governor or a department head designated by him shall be reimbursed for their actual and necessary expenses incurred in connection with such conferences or sessions, or in lieu thereof shall receive mileage and ten dollars ($10) per day of actual service."

The Governor has appointed the Medical Director of the State Public Health Department to act as chairman of the Medical Advisory Committee and to direct all medical activities. He has also appointed Dr. Justin J. Stein, chairman of the Emergency Service Committee for the California Medical Association, to be a member of this Citizens' Advisory Committee.

NEEDED LEGISLATION

No provision is made in the California Disaster Act to cover professional licenses while working under mutual aid agreements with neighboring states under civil defense. Provision should be made in the act for the temporary licensure coverage of California physicians working in Nevada and Arizona, or any other state, in the event of a grave civil emergency. Also, provisions should be made to provide for the coverage of injuries or sickness compensation to physicians while engaged in such work. Provisions to provide compensation for injuries while working as civil defense workers in California have already been enacted. Recommendations to cover the above have already been made to Governor Warren by Paul Larsen and the Citizens' Medical Advisory Committee on July 12, 1950.

ATOMIC, BIOLOGICAL, AND CHEMICAL WARFARE

Atomic Warfare.

Dr. Charles L. Dunham, of the Atomic Energy Commission, has expressed his views as follows:[9] "I should like to emphasize my own personal view on the importance of keeping a proper perspective in civil defense activities. The atom bomb has added a new factor to be reckoned with in modern warfare, but it is not sound thinking to over-emphasize the role atomic energy will play in any future war to the exclusion of planning for emergency medical support against conventional block busters and fire bombs or such conventional forms of warfare as bacteriological and poison gas."

We should plan for atomic bomb warfare. An atomic bomb detonated in the air over a large city will probably do the following:

1. Knock out 60 per cent of the hospital bed capacity and a large percentage of medical personnel in the area.

2. Destroy 40 per cent of the fire fighting equipment.

3. Cause electric power failures and shortages of water supply, food and shelter.

4. Necessitate care for thousands of casualties and the evacuation of casualties to areas 40 or more miles away from the area.

Mutual aid agreements with non-involved areas must also be planned. If a good workable civil defense plan is in operation with mutual aid agreements, the number of casualties from atomic bombings can be greatly reduced.

Considerable data regarding atomic warfare will be furnished to California physicians in the near future.

Biological Warfare.

In September 1950 the National Security Resources Board presented all available non-classified data regarding biological warfare to the various states. This means of warfare may be used by saboteurs prior to an attack. Good sanitation and special

emphasis upon public health precautions will reduce the hazards of warfare of this type.

It will be necessary for civilians to report unusual sickness of themselves and any of their domestic animals to physicians who, in turn, can carry out proper reporting of such diseases.

Civilians should be encouraged to seek advice and information from their physicians regarding any unusual sickness of humans, plants, or animals. The Public Health, Veterinary, and Agricultural services have been advised to be aware of the possibilities of biological warfare.

Chemical Warfare.

Data regarding chemical warfare are to be made available to all state civil defense groups.

CONCLUSION

All local medical components of the California Medical Association should at once appoint civil defense committees. These committees are to proceed rapidly in organizing the medical personnel and hospitals in their areas. The slogan "It is later than you think" should be adopted.

The organized medical profession must take the initiative in medical civil defense planning. Civil defense is here to stay. Effective local planning is the most important step to insure success in time of disaster.

1407 South Hope Street.

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3. The Effect of Bombing on Health and Medical Care in Germany. U. S. Strategic Bombing Survey, U. S. Government Printing Office, Washington, D. C., 1950.

4. Quoted by Colonel William L. Wilson, M.C., U.S.A. How Should We Apply These Lessons Learned in World War II to Future Planning? (Data to be published.)

5. Hearing before the Joint Committee on Atomic Energy and 81st Congress of the U. S. on Civil Defense Against Atomic Attack. Part 2, March 30, 1950. U. S. Government Printing Office, Washington, D. C., 1950.

6. The Prime Minister and the Minister of Defense: Strength and Casualties of the Armed Forces and Auxiliary Services of the United Kingdom 1939 to 1945, London, H.M.S.O. (Cmd. 6832), 1946.

7. Quoted by Colonel William L. Wilson. (See Reference 4.)

8. California Disaster Act. Earl Warren, Governor, California State Printing Office.

9. Statement prepared by Dr. Charles L. Dunham, Chief, Medical Branch, Division of Biology and Medicine, A.E.C., for meeting of Council on National Emergency Medical Service of A.M.A., May 6, 1950.

* * *

NOTE: Colonel William L. Wilson, M.C., U.S.A., in office of the Surgeon General of the Army, Washington, D. C., has written numerous excellent articles on civil defense for those interested in this subject.

In Memoriam

BEATTIE, WILLIAM A. Died in Penryn, September 5, 1950, aged 69, in an automobile accident. Graduate of Cooper Medical College, San Francisco, 1912. Licensed in California in 1912. Dr. Beattie was a member of the Sacramento Society for Medical Improvement, the California Medical Association, and the American Medical Association.

✣

CROOKS, SAMUEL A. Died in Loma Linda, September 2, 1950, aged 58, of coronary thrombosis. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1927. Licensed in California in 1929. Dr. Crooks was a member of the San Bernardino County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

GEORGE, WILLIAM A. Died in Loma Linda, September 4, 1950, aged 84, of cerebral arteriosclerosis. Graduate of the University of Michigan Medical School, Ann Arbor, 1894. Licensed in California in 1911. Dr. George was a retired member of the San Bernardino County Medical Society, and the California Medical Association.

✣

JAMES, CHARLES S. Died in Fairfield, Iowa, September 11, 1950, aged 79. Graduate of the University Medical College of Kansas City, Mo., 1891. Licensed in California in 1924. Dr. James was a retired member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

KAHN, MAURICE G. Died in Los Angeles, September 12, 1950, aged 77, of a coronary. Graduate of Harvard Medical School, Boston, 1898. Licensed in California in 1914. Dr. Kahn was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

LOW, TRIUMPH C. Died in Los Angeles, September 17, 1950, aged 78. Graduate of the Chicago Homeopathic Medical College, 1897. Licensed in California in 1900. Dr. Low was a member of the Los Angeles County Medical Association, a life member of the California Medical Association, and a Fellow of the American Medical Association.

✣

MCCOY, EARL T. Died in Los Angeles, September 14, 1950, aged 66, of coronary thrombosis. Graduate of the College of Physicians and Surgeons, Los Angeles, 1918. Licensed in California in 1918. Dr. McCoy was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

McGRAW, HARRIET G. KURTZ. Died in San Bernardino, June 5, 1950, aged 59, of carcinoma of the pancreas. Graduate of Bennett Medical College, Chicago, 1907. Licensed in California in 1917. Dr. McGraw was a member of the San Bernardino County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

MACCRACKEN, WILLIAM B. Died in Piedmont, September 14, 1950, aged 81, after a long illness. Graduate of New York University Medical College, 1893. Licensed in California in 1911. Dr. MacCracken was a retired member of the Alameda County Medical Association, and the California Medical Association.

✤

SHUMATE, FREDERICK O. Died in New York City, August 8, 1950, aged 49, of myosarcoma—metastatic to lung (from scar on leg). Graduate of Northwestern University Medical School, Chicago, 1931. Licensed in California in 1931. Dr. Shumate was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

TERRY, WALLACE I. Died in San Francisco, September 22, 1950, aged 81, of diverticulitis, sigmoid colon. Graduate of the University of California Medical School, Berkeley-San Francisco, 1892. Licensed in California in 1893. Dr. Terry was a retired member of the San Francisco County Medical Society, and the California Medical Association.

✤

TWITCHELL, EDWARD W. Died in San Francisco, September 3, 1950, aged 79. Graduate of Cooper Medical College, San Francisco, 1892. Licensed in California in 1893. Dr. Twitchell was a retired member of the San Francisco County Medical Society, and the California Medical Association.

✤

WALLACE, WILLIAM S. Died in Las Vegas, Nevada, September 15, 1950, aged 81, of coronary thrombosis. Graduate of Jefferson Medical College of Philadelphia, 1893. Licensed in California in 1920. Dr. Wallace was a retired member of the Orange County Medical Association, the California Medical Association, and an Associate Fellow of the American Medical Association.

Questions and Answers about C. P. S.

Question: Under the Veterans' Program, is it permissible to charge veterans in addition to the fees paid by C.P.S.-VA?

Answer: No. The payment for medical services rendered for authorized treatment is payment in full for such services. The veteran may not be charged in excess of the fees allowed under the C.P.S.-VA program.

However, when a veteran is being treated for more than one condition, only one of which is service-connected, the doctor may charge the veteran his usual fee for treatment of the non-service connected condition.

Question: Will the Veterans' Program authorize me to perform an examination requested by a veteran for pension purposes?

Answer: No, unless specifically authorized by the Veterans Administration. Any examination requested by the veteran to be used in prosecuting his claim for compensation must be paid for by him as a private patient.

Question: How does C.P.S. establish fees for removal of tumors, inasmuch as the fee schedule indicates a range of unit values for these procedures?

Answer: Several factors are considered in establishing C.P.S. fees for removal of tumors. These factors include the location and size of the tumor, whether it is malignant or benign, difficulties encountered in its removal, and the time required for the excision. The doctor should always provide this information on bills submitted to C.P.S. This will avoid incorrect payment and delay in processing the claim while C.P.S. contacts the physician for additional information.

Question: Are preoperative surgical consultations covered by the C.P.S. Surgical Contract?

Answer: C.P.S. liability under the Surgical Contract begins at the time of surgery. Therefore, *preoperative* care (such as consultations and examinations) are not benefits of the Surgical Contract. This care is considered to be medical care and thus only payable by C.P.S. when the member has medical benefits which apply.

Question: Is it true that dependents of C.P.S. members enrolled through C.S.E.A. now have medical-service-while-hospitalized?

Answer: Yes, in a large number of cases. In the past the C.S.E.A. contract provided surgical, hospital and two-visit-deductible medical benefits for the subscriber, and surgical-hospital for family dependents. Recently medical-service-while-hospitalized was offered to the family dependents, and approximately 10,000 have now added these benefits to their existing surgical-hospital coverage. All these persons have been issued new C.P.S. identification cards which show that they have medical-service-while-hospitalized protection. C.S.E.A. dependents who have not availed themselves of the supplementary benefits retain their old identification cards.

Question: If I have a C.P.S. case which I believe is payable under Workmen's Compensation, do I bill both Workmen's Compensation and C.P.S.?

Answer: No. Bill Workmen's Compensation; if payment is rejected, then bill C.P.S., indicating the reason for rejection by Workmen's Compensation. C.P.S. will make payment if the services rendered are benefits of the member's contract. If it appears that litigation will delay settlement by Workmen's Compensation, be certain to notify C.P.S. within six months from date of services so that if the insurance carrier does not pay the claim, it can still be paid by C.P.S.

Question: What is the difference between Blue Cross and Blue Shield?

Answer: Blue Cross is the association of hospital-sponsored non-profit hospitalization plans throughout the nation. Blue Shield is the national association of doctor-sponsored medical and surgical plans. California Physicians' Service is the Blue Shield plan in California.

In Southern California, C.P.S. has operated jointly with Blue Cross for many years. As of August 1, 1950, this joint relationship was terminated. Each now operates independently, and C.P.S.-Blue Shield now offers to the public a hospitalization contract in addition to its surgical and medical programs.

Thus, since an increasing number of C.P.S.-Blue Shield patients in Southern California will have C.P.S. hospitalization, it is more than ever important for doctors and their nurses and secretaries to examine patients' identification cards to determine if the hospitalization is provided by C.P.S.-Blue Shield or Blue Cross.

Question: Why is it that bills I send to the Veterans' Program about the middle of any given month are not paid as quickly as those I send in around the first of the month?

Answer: Requests for reauthorization are processed by the Veterans' Program between the 20th and 30th of each month. Any bills received during this period require special handling. The normal period for processing bills is between the first and 20th of the month. Therefore, bills on Form 53 which are received between the first and 15th of each month are handled more rapidly than those received during the latter part of the month.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Seven appointments to the faculty of the University of California at Los Angeles School of Medicine were approved last month by the regents of the university. The appointees are: Dr. Lowell S. Goin, clinical professor of radiology; Dr. Horace W. Magoun, professor of anatomy; Dr. Robert Mazet, associate clinical professor of surgery; Dr. Daniel G. Morton, professor of obstetrics and gynecology; Dr. Claude S. Mumma, associate clinical professor of surgery; Dr. Neville H. Rupp, assistant clinical professor of surgery, and Dr. David H. Sprong, associate clinical professor of surgery.

* * *

Dr. Byron O. Mork, Jr., recently was appointed district health officer for the Hollywood-Wilshire district, with headquarters at 1456 North Bronson. In this post with the City of Los Angeles department of health he succeeds Dr. Monroe Epstein who was acting district health officer for Hollywood-Wilshire and who is in charge of the northeast district as part-time district health officer.

* * *

The third annual midwinter **radiological conference** sponsored by the Los Angeles Radiological Society will be held at the Biltmore Hotel, Los Angeles, February 24 and 25, 1951. The cost for the two-day session is $15. A banquet will be held on Saturday evening, February 25, at which the guest speaker will be Dr. Edward Chamberlain, professor and chairman of the department of radiology, Temple University, Philadelphia. A second out-of-state speaker at the conference will be Dr. Edward B. D. Neuhauser, roentgenologist, Infants and Children's Hospital, Boston. The fee for the banquet will be $5. Reservation for the conference and banquet should be accompanied by a check for $20 and sent to Dr. John B. Hamilton, 210 North Central Avenue, Glendale 3, California.

* * *

The Los Angeles Urologic Society has announced that the fourth **urologic postgraduate seminar** will be held at the Ambassador Hotel, Los Angeles, November 27 to December 1, 1950. The seminar is sponsored by the American Urological Association and by the western branch of the association. The course is designed, the announcement said, "primarily to cover recent developments in urology, including the outstanding contributions in research as well as those in the surgical field. Basic science courses related to urology will be emphasized."

Fee for the course will be $60, which includes tuition, banquet and luncheons. Certificates of eligibility for veterans will be processed by the College of Medical Evangelists.

Further information may be obtained from Dr. Tracy O. Powell, secretary, Suite 915, 6253 Hollywood Boulevard, Los Angeles, 28.

SAN FRANCISCO

Dr. Anthony J. J. Rourke, superintendent of Stanford Hospitals, was elected president-elect of the American Hospital Association at the recent annual meeting of that organization in Atlantic City.

An $81,000 **grant by the National Heart Institute** was awarded last month to the University of California in support of research on fundamental biochemical and biophysical factors in the pathogenesis of atherosclerosis. The research project is under the direction of Dr. John W. Gofman.

SANTA CLARA

An advertising campaign by the Santa Clara County Medical Society to acquaint the public with its views on medical questions has been acclaimed by the Bureau of Advertising, American Newspaper Publishers Association, as one of the **outstanding advertising performances** of 1949. The society's advertising project was one of 50 campaigns chosen from hundreds of entries for inclusion in the 1950 edition of "The Blue Book of Newspaper Advertising." The campaign was a series of ads, each expounding some phase of the society's policies regarding free medical care, fees for medical services, and the benefits of voluntary as compared with compulsory health insurance.

Within a short time after the start of the advertising campaign, hundreds of inquiries were received for information on the availability and benefits of voluntary health insurance in the area. Numerous comments came in from social service organizations, public health officials, nurses and welfare department employees, all commending the society for establishing such clear-cut policies and for making them known to the public.

YOLO

Dr. Roy A. Neumann has been appointed county physician of Yolo County to succeed Dr. Frank Peter who resigned to enter private practice.

GENERAL

More than 2,000 medical specialists in x-ray and radium from every state in the Union are expected to attend the 36th annual meeting of the **Radiological Society of North America,** which will be held in Chicago at the Palmer House, December 10 to 15, according to announcement by that organization. The opening program on Monday morning will deal with a discussion of economic problems in the field of radiology.

* * *

The ninth annual meeting of the **American Academy of Dermatology and Syphilology** will be held in Chicago from Saturday, December 2, through Thursday, December 7.

The principal sessions will be held at the Palmer House, with special courses in histopathology and mycology scheduled for Saturday and Sunday, December 2 and 3, at the medical schools of the University of Illinois and Northwestern. Special courses in x-ray and radium therapy and bacteriology of the skin will be held Saturday and Sunday at the Palmer House. There will also be special courses in anatomy and embryology of the skin and special problems in dermatohistopathology Sunday at the Palmer House.

Physician-members of **California Physicians' Service** have been paid $7,652,403 for medical treatment rendered to veterans since inauguration in 1946 of the Home Town Care Program, according to a study recently completed by the C.P.S. veterans' department.

The study gives the following breakdown of payments:

April 1, 1946 to March 31, 1947	$1,425,191
April 1, 1947 to March 31, 1948	1,741,789
April 1, 1948 to March 31, 1949	1,840,424
April 1, 1949 to March 31, 1950	2,159,501
April 1, 1950 to June 30, 1950	485,000

Also revealed by the study was that during the first nine months of 1949 more money was paid to California doctors under the C.P.S.-VA program than the combined payments under all other Blue Shield programs where the health plan acts as an "intermediary" between VA and veterans. In that period C.P.S. physician-members received $1,614,549; doctors in the seven other intermediary plans received $901,467.

Other facts brought out by the survey include:

1. A tabulation in March 1950 showed 5,255 C.P.S. physician-members had one or more veterans under treatment.

2. Approximately 62,500 California veterans have been treated under the C.P.S.-VA program during the three years of 1947-1950.

The study also revealed a notable **reduction in administrative costs.** In 1947, 130 employees (both C.P.S. and VA) were producing an average of 7,500 authorizations for treatment per month. Currently, only 97 employees are required to produce an average of 11,000 authorizations per month.

* * *

The American Dermatological Association is offering **a prize of $300 for the best essay** submitted on original work, not previously published, relative to some fundamental aspect of dermatology or syphilology. Manuscripts should be sent not later than February 1, 1950, to Dr. Louis A. Brunsting, secretary, American Dermatological Association, 102-110 Second Avenue, Southwest, Rochester, Minn.

Competition is open to scientists generally; not necessarily physicians.

The prize winner may be invited to present his paper before the annual meeting of the American Dermatological Association which will be held May 23 to 26, 1951, at Hot Springs, Virginia.

Federal and state financial aid will help construct **nine hospital and health center facilities** in California in the 1950-51 fiscal year, but tentative allocations to 11 other projects have been rescinded due to a 50 per cent reduction in federal funds available for the hospital construction program, the State Department of Public Health announced recently.

Projects **approved for allocation** this fiscal year include seven health centers and two hospitals, the Health Department said. They are: San Benito County Health Center, Hollister; Madera County Health Center, Madera; Kings County Health Center, Hanford; San Luis Obispo County Health Center, San Luis Obispo; Butte County Health Center, Oroville; Santa Clara County Health Center, San Jose; Los Angeles City Health Center (Westchester District), Los Angeles; St. Joseph's Hospital, Eureka—75-bed new hospital facility; Centinela Valley Community Hospital, Inglewood—48-bed addition.

Projects from which it was **necessary to withdraw financial assistance** are: Daniel Freeman Memorial Hospital, Inglewood; Pittsburg Community Hospital District, Pittsburg; St. Augustine-West View Hospital, Los Angeles; San Diego Memorial Hospital, San Diego; Fresno County Hospital, Fresno; Del Norte County Local Hospital District, Crescent City; Rancho Los Amigos, Hondo; Herrick Memorial Hospital, Berkeley; San Bernardino City Health Center, San Bernardino; San Jose Public Health Center, San Jose; and Orange County Health Center, Santa Ana.

* * *

The fifth congress of the **Pan-Pacific Surgical Association** will be held in Honolulu November 10 to 21, 1951.

"The object of the Pan-Pacific Surgical Association," according to the official announcement of the meeting, "is to bring together surgeons from countries bordering on the Pacific Ocean so as to permit the exchange of surgical ideas and methods and to develop a spirit of good fellowship among the various races represented. Although it was planned that meetings would be held every three years, world events have permitted but four conferences since the organization was conceived—the first in 1929 and the last in 1948."

Further information may be obtained by writing the Pan-Pacific Surgical Association office, Suite 7, Young Building, Honolulu, T. H.

BOOK REVIEWS

DIE HAUTTUBERKULOSE UND IHRE THERAPIE. By Prof. Dr. Gustav Riehl and Dr. Oswald Kopf. Verlag Wilhelm Maudrich, Wien—1950.

This book, in German, is an excellent summary of our knowledge of cutaneous tuberculosis and particularly of its successful treatment with vitamin D_2. The authors are particularly qualified to speak on this subject as they have a wealth of clinical material upon which to draw. One can see as many cases of cutaneous tuberculosis in a day's visit to the Lupus Heilstat and the Wilhelminenspital in Vienna as he would see in a lifetime in dermatology in California.

After a general review of the subject, with excellent clinical photographs, the authors take up in detail the treatment which has done so much to conquer this disease, namely vitamin D_2. The "before and after" photographs show the good results of treatment. Other forms of therapy such as Finsen-Lomholt lamp therapy, tuberculin, local applications and surgery are well covered.

* * *

BRIDGES FOOD AND BEVERAGE ANALYSIS. By Marjorie R. Mattice, A.B., Sc.M., Assistant Professor of Biochemistry, Graduate School of Medicine, College of Medical Evangelists, Los Angeles. Third Edition, Thoroughly Revised. Lea and Febiger, Philadelphia, 1950. $5.50.

This is probably the most comprehensive reference of its kind available to the physician. It presents under one cover a great abundance of data convenient for answering specific inquiries about the values of foods. However, it has several disadvantages: To begin with, it buries in its almost 400 pages the complete picture of any one food. This defect is especially apparent to the student and dietitian who must plan a diet embracing vitamins and minerals as well as nutritive and caloric values. There is also a considerable inconsistency in emphasis: For example, the acidity and alkalinity tables are presented in great detail, whereas there is brief treatment for the cholesterol and amino acid contents of food. No tables of ideal weights for adults are given. Tables 8 and 9 (of average weights for men and women) are misleading to the student and ignore the fact that the average weight of older American adults is far above the ideal and that the mortality is correspondingly higher. The calcium and oxalic table of foods could be benefited by adding a footnote for comparing the percentage of calcium in milk and cheese. While many common "brand" foods are included, there are many, equally common, omitted (e.g., Triscuit, Monterey Jack cheese, chewing gum, etc.).

It seems too bad that there is such a variation in the values for the same food as given by different authorities in the nutritional field. It is also too bad that an authority such as this one should give contradictory values for the same food. For instance, on page 81, a 50 gm. egg is listed as having 6.7 gm. of protein, 5.2 gm. of fat and 75 calories, whereas a 50 gm. *poached* egg is listed as having 6.2 gm. of protein, 5.8 gm. of fat and 80 calories. Perhaps the figures were compiled from different investigators at different times and were not studied by the compiler.

For a future edition of this volume, the reviewer suggests that the principal tables be divided into groups of foods (such as cereals, milk, meats and legumes) with as complete a picture as possible of the food composition including carbohydrates, proteins, fats, minerals, vitamins, acidity and alkalinity, cholesterol, amino acids and calories.

Despite these various criticisms, the book is still recommended as being as good a reference as one can find in its field.

PROCTOLOGY IN GENERAL PRACTICE. By J. Peerman Nesselrod, B.S., M.S., M.Sc. (Med.) M.D., F.A.C.S., F.A.P.S., Associate in Surgery, Northwestern University Medical School. Illustrated. W. B. Saunders Company, Philadelphia, 1950. $6.00.

This is a highly personalized book. The author gives an account of his own ideas, experiences and practice; he details just how he works to a much greater extent than is found in the average medical text. As one is guided through the various chapters, which include the fundamental anatomy and physiology, diagnostic procedures and disease conditions of the anus and rectum, one feels much more than usual that the author is personally standing over his shoulder. The illustrations are well done and explicit; the paper and printing are good.

The use of the book, as its title implies, is primarily for the general practitioner who wishes to do diagnostic or operative proctology. It is a sound and practical manual which can be readily recommended.

* * *

HUMAN STERILIZATION TECHNIQUES OF PERMANENT CONCEPTION CONTROL. By Robert Latou Dickinson, M.D., and Clarence James Gamble, M.D. May be ordered from Planned Parenthood Federation of America, 501 Madison Ave., New York 22, N. Y. 1950.

This is an attractively gotten-up brochure on the subject of sterilization. It discusses the possible reasons for the procedure, the commonly employed techniques, the efficiency of these techniques, and the implications. It is well illustrated by line drawings. Under indications are included mental deficiency, certain cases of mental disease and of epilepsy, and inheritable diseases which kill, cripple, or severely handicap. Also included are conditions which have necessitated an excessive quota of cesarean sections, diseases of the heart, lungs or kidneys which make pregnancy hazardous, excessive number of children or enfeebled health which render further pregnancy an unwarrantable risk, mental illness which causes child care to constitute a serious complication, mental deficiency and psychosis which interfere with the proper upbringing of potential children, and the circumstance in which "a man and wife have produced all the children they can rear with health, happiness and usefulness for progeny and parents."

Anatomy and techniques are described for both male and female. The illustrations make this section clear even to the uninitiated. The authors appear to favor the Pomeroy technique. The small and decreasing percentage of failures is remarked.

One section is devoted to the thesis that the usual techniques, involving the interruption of the continuity of the Fallopian tubes in the female, and of the vas deferens in the male do not interfere with sexual function, an idea often held erroneously. The authors wish to disabuse the public of the idea that sterilization (by the technique mentioned) means castration.

The reviewer fails to comprehend the intention of the brochure. Its language and format suggest that it is intended for the laity; if so, the sections dealing with technique are needlessly detailed and contain words not easily understood by this group. If the brochure is for the profession, it is incomplete.

The authors' philosophy appears to be eugenically sound but how widely accepted it will be cannot be said. Certainly not everyone will approve of many of the indications espoused by the authors.

PLASTIC AND RECONSTRUCTIVE SURGERY — A Manual of Management. By Ferris Smith, M.D., F.A.C.S., Consultant in Plastic Surgery, Blodgett Memorial Hospital, Grand Rapids, Michigan. W. B. Saunders Company, Philadelphia, 1950. $15.00.

In a 900-page work, Dr. Ferris Smith of Grand Rapids, Mich., has summarized the experience of his 35 years of plastic surgical practice in a form which is both readily useful and dogmatic in detail for any given surgical procedure. The book is well set up and well illustrated and reviews many accepted procedures in the treatment of congenital and acquired deformities of the head and neck, as well as grafting of burns, and some peripheral plastic operations.

Dr. Smith, who is one of the great pioneers in plastic surgical teaching in the United States, stresses again and again the importance of using local tissue rather than skin-grafts on exposed surfaces of the head and neck. This is a most worthwhile principle and should be followed wherever possible. His techniques of multiple excision and Z-plasty are very useful but are emphasized to the point of overdoing them, particularly as regards the extremities.

The procedures illustrated are for the most part satisfactory and are good standard practice in plastic surgery. On the other hand, some procedures recommended seem unnecessarily complicated with many steps which accomplish little in the way of end result. Particularly notable is a many-staged procedure for total eyelid reconstruction in which other surgeons might feel that obliteration of the socket altogether would give a more satisfactory end result without the tedium of so many operations.

The broader aspects of plastic surgery, which include the care and treatment of carcinoma of the head and neck and its resulting defects, reconstructive surgery of the hand, lower extremity surgery, genito-urinary and gynecologic plastic surgery and some other fields, are covered very lightly in this manual, and one must seek other texts for authoritative procedures if one is to have a well-rounded authority on all phases of the specialty. In defense of this limitation of the text, Dr. Smith states in the preface that "There are many borderline cases occurring in general, genito-urinary and orthopedic surgery, dermatology, etc. It is the author's belief that such conditions as hypospadias and epispadias and the like should be corrected by the urological surgeons, absence of the vaginal tract by the gynecologist, many of the lesions of the tendons, nerves and bones of the hand and feet by an orthopedist." With this, most plastic surgeons will not agree, as the broad general surgical background of modern plastic surgery encompasses many fields which overlap other special fields of endeavor, and the plastic surgeon would feel his prolonged training in various fields to be of limited value if confined to head and neck and surface lesions.

This book is of value both to the medical student and to the interested surgeon in related specialties as well as to the plastic surgeon. It provides, however, but one man's point of view and should be supplemented by reading and experience with other authors for a well-rounded conception of modern plastic surgery.

* * *

ANXIETY IN PREGNANCY AND CHILDBIRTH. By Henriette R. Klein, M.D., Associate in Psychiatry, Columbia College of Physicians and Surgeons; Howard W. Potter, M.D., Professor of Psychiatry, Long Island College of Medicine; and Ruth B. Dyk, M.S., Research Department, New York City Youth Board. Paul B. Hoeber, Inc., 1950. $2.75.

This slender volume reports the results of interviews with 27 primigravidae (erroneously referred to as primiparae throughout the book) who were attending the public prenatal clinic at the Long Island College Hospital between September 1945 and June 1946. Interviewing was done by a psychiatric social worker. The authors, two psychiatrists and the above-mentioned social worker, wanted to find out why childbearing is a trying experience for some, but easy and enjoyable for others. The patients were asked about attitudes, misconceptions, superstitions, and anxieties. Because the subjects of the study admittedly had almost no intellectual interests, had been exposed to a minimum of formal education, and were not used to verbalizing about themselves, one wonders about the significance of the information obtained from this peculiar sample of the obstetric population. The 12 points brought out in the summary are well known to most obstetricians who have been observant attendants in any large prenatal clinic. Posibly, however, these concepts are not equally familiar to psychiatrists, for whom the volume may have a modest value.

The appendix contains summaries of the histories of the 27 subjects. The book is nicely made but there is no index.

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THE GENEALOGY OF GYNAECOLOGY — History of the Development of Gynaecology Throughout the Ages— 2000 B.C. - 1800 A.D. with excerpts from the many authors who have contributed to the various phases of the subject. By James V. Ricci, A.B., M.D., Clinical Professor of Gynaecology and Obstetrics, New York Medical College. Second Edition. The Blakiston Company, Philadelphia, 1950. $8.50.

The issuance of a second and enlarged edition of Ricci's "Genealogy of Gynaecology" speaks well not only for the book but also for the intellectual state of our profession which, in spite of the uncertainties of the immediate and somewhat nebulous future, still is in the mood to concern itself with the past of medicine. Like other Ricci contributions to the history of obstetrics and gynecology his Genealogy presents a scholarly survey of a huge volume of recorded knowledge beginning with the nebulous past of the second pre-Christian millenium and ending with the close of the 18th century when gynecology was about to emerge from a long and stale impasse. Ricci has succeeded admirably in condensing a monumental mass of information into a readable tome of some 500 pages. He traces the development of gynecologic diagnosis and therapy step by step from the dim past when priests and shamans of the Mediterranean and Far-Eastern worlds were probing into the physiology of the female genital organs, but only to founder in a sea of superstitions, to the dawn of gynecology when John Hunter said in 1785 that he saw no reason why a woman should not suffer spaying without danger as well as other animals do, and that merely making an opening into the abdomen was not highly dangerous. Every page of this treatise is replete with the type of information that stimulates thought and makes the reader pause in wonderment over man's ever-present fallibility.

In writing the development of gynecology Ricci follows the accepted epochal divisions of the history of medicine. Where the past is vague and confused the author contents himself with merely citing the fragmentary bits of information which have come down to us on papyri and clay tablets. Where the knowledge of the past was preserved through word of mouth but not recorded until centuries later he has aimed to clarify obscure issues by comparing the several versions of the recorders. The later knowledge as recorded by the printing press he has sifted and correlated to make a readable whole. As in other publications Ricci presents a wealth of detailed annotations and reliable source of references. The material is presented in an orderly fashion yet it is not of the stuff that makes for casual reading. However, for the discriminating reader and in particular for the student of history, regardless whether medical or otherwise, Ricci's treatise will prove itself invaluable aside from making delightful reading.

Dr. Edward A. Schumann of Philadelphia, author of outstanding contributions to gynecology and obstetrics, has written a sparkling introduction for the second edition. The Blakiston Company has seen to it that the printing (The Maple Press Company of York, Pa.), the paper and the binding are of the highest quality, yet the cost has been held down to $8.50, a bargain in view of the high cost of printing and binding. Your reviewer considers the second edition of Ricci's "Genealogy of Gynaecology" an outstanding contribution to the history of medicine and a valuable reference book.

* * *

CLINICAL ELECTROCARDIOGRAPHY. By Francis F. Rosenbaum, M.D., Assistant Clinical Professor of Medicine, Marquette University School of Medicine. Edited by Henry A. Christian, A.M., M.D., LL.D., Sc.D., Hersey Professor of the Theory and Practice of Physic, Emeritus, Harvard University. Oxford University Press, New York, 1950. $4.50.

This concise monograph on the electrocardiogram is among the best of recent texts on this subject. The author, well qualified to speak for the Wilson school of electrocardiographic interpretation, does so in lucid, well organized sections.

The electrocardiographic reproductions are excellent and are conveniently arranged with the text and with pertinent facts of illustrative case histories. The emphasis placed upon the limitations of the electrocardiogram and its proper use in clinical medicine gives the book unique value as an introduction for the beginner, and as a reminder to the over-enthusiastic electrocardiographic interpreter.

One minor annoyance in the book is the retention of the same page numbers as in the original Oxford Loose Leaf Medicine from which this monograph was reprinted. Otherwise the make-up of the book, its index and bibliographic arrangement are entirely adequate.

This book deserves a place in the library of every physician interested in cardiovascular disease, and can be read with profit by all who are interested in the clinical application of the electrocardiogram.

* * *

DISEASES OF THE HEART. By Charles K. Friedberg, M.D., Associate Physician, Mount Sinai Hospital, New York. W. B. Saunders Company, Philadelphia, 1949. $11.50.

The author presents this book as an effort "to provide a comprehensive and integrated exposition of the diseases of the heart." In the reviewer's opinion the book fulfills this purpose and is the best of the more recent books on cardiac disease. Its method of presentation presupposes some fundamental information on the part of the reader in cardiovascular physiology and electrocardiography, so that it should prove more helpful as a reference text for the advanced student than as an introduction for the beginner in the study of heart disease.

The organization of the material presented is excellent and the various sections are conveniently divided into chapters which make for ease in reading and reference. The subject matter is more complete and current than any other available text in this field, and opposing views of controversial questions are adequately summarized.

The section on circulatory failure is an outstanding one and should be read by every internist who has been unable to keep abreast of the voluminous literature related to this problem in recent years.

Unfortunately, titles are not included with the references. Because of that space-saving device the greatest value of a remarkably complete bibliography cannot be attained. Revision of the bibliography in succeeding editions with this in view would add greatly to the book as a reference work.

TEXTBOOK OF ENDOCRINOLOGY. Edited by Robert H. Williams, M.D., Executive Officer and Professor of Medicine, University of Washington Medical School, Seattle. W. B. Saunders Company, Philadelphia, 1950. $10.00.

During the past three decades many of the hormones have been made available in pure form and much has been learned of the manner in which they influence propagation, growth, maturation and general metabolic activities. With the accumulation of such knowledge there has been acquired a much better understanding of the clinical endocrinopathies. This book discusses the management of these conditions based on the application of fundamental information. It fills a long-felt need for an authoritative text on clinical endocrinology.

The editor himself has written chapters on the general principles of endocrinology, the laboratory procedures involved, the pituitary gland and the thyroid gland. He has had the collaboration of experienced investigators and teachers in the remaining chapters. The headings of the chapters and their authors include: Chronic Adrenal Hyperfunction (Edwin J. Kepler and William Locke), Adrenal Cortical Insufficiency and the Pancreas and Diabetes Mellitus (George W. Thorn and Peter H. Forshan), The Testes (John Eager Howard and William Wallace Scott), the Ovaries (George Van S. Smith), Diseases of the Parathyroid Glands (Edward C. Reifenstein, Jr.), Influence of Endocrine Glands Upon Growth and Development (Lawson Wilkins), Neuroendocrine and Psychodynamic Aspects of the Endocrinopathies (Harry B. Friedgood) and Obesity (L. H. Newburgh).

The subjects are discussed with clarity and brevity enough for the book to be used as a text in medical schools. There is also sufficient detail for it to serve as a reference for the student or physician. The photographs are good, except for some of those reproduced from the older medical literature. The volume is a welcome addition to the literature of internal medicine.

* * *

DISEASES OF THE FOOT. By Emil D. W. Hauser, M.S., M.D., Associate Professor of Bone and Joint Surgery, Northwestern University Medical School. Second Edition. W. B. Saunders Company, Philadelphia, 1950. $7.00.

This second edition of "Diseases of the Foot" covers the anatomy, the physiology, the diagnosis and the treatment of the many abnormal conditions found, rarely as well as frequently, in the feet. Many excellently reproduced roentgenograms, photographs and line drawings are valuable in illustrating the details of pathologic conditions of the foot. For instance, the accessory bones of the foot are covered in a way that will aid the specialist, as well as the general practitioner, in differentiating normal findings that are often mistaken for abnormal, and vice versa.

The orthopedic specialist will find the book valuable, because it represents the considered views of a careful man who has spent the major part of a professional life in the study of feet, of gait and of posture. The author probably expects the specialist to disagree with certain of his ideas about indications for therapy and the way the therapy is carried out. At the same time, the specialist will benefit by reviewing his own reasons for his favored forms of therapy and his reasons for differing with the author. Many in this country follow Hiram Kite of Atlanta in the therapy of club feet and it is probable that the novice can more easily follow Kite than Hauser. An inexperienced man would probably run into difficulty in trying to follow Hauser in the correction of a deformed foot by using the Thomas wrench. In Hauser's hands it is probably useful.

The diagnostician and the general practitioner will find the book valuable for reference but the general man will likely have difficulty in following certain of the detailed instructions.

California MEDICINE

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Terramycin in Urinary Tract Infections

R. GORDON DOUGLAS, M.D., THOMAS L. BALL, M.D., and
IONA F. DAVIS, M.D., *New York*

SUMMARY

Terramycin® is an effective agent in the control of urinary tract infections with organisms of the enteric group.

The drug is tolerated by mouth and no serious side-reactions occur. In cases in which there is no organic or obstructive disease, the response to Terramycin as a urinary antiseptic is prompt and effective. In several cases in which there was severe organic and obstructive disease and the organism was highly resistant, the course of the disease was not altered by giving Terramycin.

TERRAMYCIN®* is a new antibiotic yielded by the recently discovered actinomycete, streptomyces rimosus. It is a crystalline amphoteric substance which can be chemically reacted with certain acids or bases to form crystalline salts. In the dry crystalline state Terramycin and its salts possess good stability at 25° C. A unit of Terramycin is equivalent to one microgram of the pure amphoteric compound. The activities of the salts of Terramycin are stated in terms of the equivalent weight of pure Terramycin. The hydrochloride, the sulfate and the true sodium salt of Terramycin have been shown to maintain their potency for several weeks at 50° C. Aqueous solutions of Terramycin showed no loss of potency in 20 days with a pH of 5.0 or below.

From the Department of Obstetrics and Gynecology of the New York Hospital and Cornell Medical College.

Guest speaker's address before the Section on Obstetrics and Gynecology at the 79th Annual Session of the California Medical Association, April 30-May 3, 1950, San Diego.

*Terramycin is made by Charles Pfizer & Co., Inc.

ABSORPTION AND EXCRETION

The drug is rapidly absorbed by either the oral or parenteral route. After intramuscular injection it can be recovered in the bloodstream for 24 hours. Within two hours it appears in the urine in amounts proportionate to the serum concentration.

The absorption of Terramycin from the gastrointestinal tract results in a good serum concentration within a few hours, and as much as 40 per cent of a single oral dose has been recovered in the urine. It is probable that a considerable amount of Terramycin is excreted in the feces. It changes considerably the bacterial flora of the gastrointestinal tract. In the patients so far treated no deleterious effects were noted from the suppression of some organisms or over-growth of others in the intestines.

Terramycin, like other antibiotics, traverses the placental barrier and may be found in the cord blood. This is true after the administration of as little as 2 gm. during labor. It does not appear to have any harmful effects on the newborn.

MATERIALS AND METHODS

Terramycin was used in 32 instances for treatment of urinary tract infection in patients on the obstetrical and gynecological service. Cultures of urine and urinalyses were done daily, and sensitivity tests to the amphoteric and in some cases to the hydrochloride forms of Terramycin were run by the tube dilution method. The temperature chart, the amount of pyuria, symptoms and the degree of control of the bacilluria were observed to evaluate the effectiveness of the agent. Results were considered to be good, equivocal, or poor on the following basis: A good result was recorded when in 72 hours or less the temperature fell to normal, the pyuria cleared, a negative culture was obtained and the pa-

tient was symptom-free. Equivocal results were recorded when those responses did not take place until later, or when bacilluria with mild symptoms persisted, although the other criteria were met. If Terramycin did not alter the course of the disease, the result was recorded as poor.

The group of patients treated included some with mild infections such as postoperative cysto-ureteritis and pyelonephritis of pregnancy. Several had severe organic and obstructive disease of the urinary tract. These patients had operations such as radical removal of carcinoma of the cervix with bilateral nephrostomy, wet colostomy with uretero-intestinal anastomosis or skin transplants.

DOSAGE AND TOLERANCE

A suggested dosage schedule is shown in Table 1. If the patient has no organic or obstructive disease, a dose of 250 mg. every six hours for the first five days and 250 mg. twice a day for the following five days is recommended. If organic disease is present, the amount of Terramycin given should be doubled. It is usually important to continue therapy for ten days or longer to prevent relapse or persistent bacilluria. The drug was tolerated well except for transient nausea in a few instances. One severely ill patient who had had pelvic eviscerectomy for advanced cervical carcinoma had vomiting after starting Terramycin, but in that case the abdomen was distended and the patient was not tolerating anything by mouth very well. The drug could not, therefore, be directly indicted.

Table 1.—*Suggested Dosage Schedule for Terramycin (10 Days)*

	Days 1-5	Days 6-10
No organic or obstructive disease and B. coli or A. aerogenes isolated	250 mg. every six hours	250 mg. twice daily
With organic or obstructive disease or if Ps. aeruginosa or P. vulgaris is isolated	500 mg. every six hours	250 mg. every six hours

COMPARATIVE SENSITIVITIES (IN VITRO)

It must be emphasized that the clinical effectiveness of a drug does not necessarily parallel the in vitro sensitivity determined for the organism isolated in the case. Sensitivity tests roughly indicate susceptible organisms, but exceptions are repeatedly noted. Forty organisms isolated from the urinary tract were tested against the amphoteric form of Terramycin. Wide variations in resistance were noted (Table 2). Nineteen organisms were tested against Terramycin, aureomycin and chloramphenicol for comparison. Tables 3 and 4 show the results of this study.

RESULTS OF THERAPY

The results with Terramycin were uniformly good in cases in which no organic or obstructive disease existed (Table 5). The patients with pyelitis of pregnancy or simple postoperative cysto-ureteritis responded very promptly to Terramycin. There was a prompt drop in temperature, disappearance of pyuria and bacilluria, and symptomatic relief. In three instances P. vulgaris replaced the original offender in the follow-up cultures, but the patient was asymptomatic. The effect of Terramycin is remarkably like that of aureomycin in infection of this type. This observation is based on a comparison of results obtained with Terramycin with those obtained in a large group of similar cases in which aureomycin was used on the same dosage schedule.

Five patients with organic or obstructive disease were treated. One had had pelvic eviscerectomy for advanced cervical carcinoma. She had a colostomy and bilateral ureterocutaneous transplants which

Table 2.—*Terramycin (Amphoteric Form)* Sensitivity tests (mcg./ml.) *

	No. organisms	0.2	0.4	0.8	1.6	3.13	6.25	12.5	25	50	>50
Ps. aeruginosa	18	....	....	....	....	....	1	1	4	3	9
A. aerogenes	10	1	....	2	3	1	1	....	1	1	....
B. coli	10	....	....	1	1	2	1	....	1	2	2
P. vulgaris	2	....	....	....	....	....	....	....	....	....	2

*Organisms isolated from urinary tract.

Table 3.—*Comparative Sensivity (in Vitro)** Strains of Ps. aeruginosa (mcg./ml.)

11 Organisms	Aureomycin	Chloramphenicol	Terramycin
1	0.4	6.25	6.25
2	12.5	50	50
3	50	50	>50
4	1.6	6.25	25
5	>50	>50	25
6	50	50	>50
7	50	50	>50
8	>50	50	>50
9	50	>50	25
10	>50	50	>50
11	>50	50	>50

*Organisms isolated from urinary tract.

Table 4.—*Comparative Sensitivity (in Vitro)** (mcg/ml.)

Organisms	Aureomycin	Chloramphenicol	Terramycin
A. aerogenes	50	50	25
A. aerogenes	0.8	6.25	0.8
A. aerogenes	3.13	3.13	6.25
A. aerogenes	0.4	6.25	0.2
B. coli	50	50	50
B. coli	>50	>50	25
B. coli	25	25	3.13
P. vulgaris	25	25	>50

*All organisms isolated from urinary tract.

TABLE 5.—*Terramycin Therapy in 32 Urinary Tract Infections*

Organism	No. Cases	Results		
		Good	Equivocal	Poor
No organic or obstructive disease:				
B. coli	15	14	1	0
A. aerogenes	4	4	0	0
Aerobic diphtheroids	3	2	1	0
S. albus	2	2	0	0
Aerobic non-hemolytic streptococcus	2	2	0	0
Ps. aeruginosa	1	0	1	0
With organic or obstructive disease:				
Ps. aeruginosa	3	1	0	2
P. vulgaris	1	0	1	0
A. aerogenes	1	1	0	0
Totals	32	26	4	2

were functioning well. Ps. aeruginosa were repeatedly cultured from both sides. On Terramycin therapy there was a period of over two days when several cultures were negative for the organism. Subsequently, however, cultures were positive for Ps. aeruginosa despite continuation of the therapy.

Another patient had a Stage IV carcinoma of the cervix. Bilateral nephrostomy had been done because of ureteral obstruction and uremia. Cultures consistently grew Ps. aeruginosa. Again, for a transient period after the start of therapy a few cultures were negative for the organism but the patient continued febrile and there was no lessening of pyuria. The course of the infection and disease was not altered by Terramycin.

Another of the five patients had had radical excision of the cervical stump for carcinoma. Complete bilateral pelvic lymphadenectomy had been carried out, with the usual postoperative neurogenic bladder. In addition, there was a double ureter on the right side, both parts of which emptied into the bladder with separate orifices. There was no hydronephrosis at the time the patient was treated: An indwelling catheter had been placed because of urinary retention. Cultures showed Ps. aeruginosa. Bacilluria, pyuria and pain in the right costovertebral angle abated promptly when Terramycin was given. There was no relapse and the results in this case were considered good.

The fourth patient, 34 weeks pregnant, had tuberculosis of the left kidney and a ureterocutaneous transplant had been done. The right kidney had been removed. Acid-fast bacilli were observed on one smear but not on cultures. P. vulgaris was found in the routine cultures and several cultures also grew Ps. aeruginosa. Terramycin was given as shown in the dosage schedule, and 15 cc. of para-aminosalicylic acid was given four times a day. Pyuria cleared and pain and tenderness in the left costovertebral angle disappeared. The P. vulgaris was replaced by A. aerogenes and the latter grew on every subsequent culture despite continued therapy. This was a strange reversal of the usual picture in that an organism which usually is very sensitive replaced a resistant one. The result was considered equivocal because, although the patient had no pyuria or symptoms, bacilluria persisted. Para-aminosalicylic acid was continued for several additional weeks. After the start of therapy, acid-fast bacilli were not demonstrated on cultures and could not be recovered from inoculated guinea pigs. The patient had uneventful delivery at term.

The fifth patient in the group had recurrent carcinoma of the endometrium with carcinomatosis. A space-occupying lesion of the left kidney was observed in an intravenous pyelogram. No hydronephrosis was observed, and A. aerogenes grew on cultures. Terramycin was given, the urine promptly became sterile, pyuria cleared and the patient became symptom-free.

This new drug mathematically extends the number of combinations of antibiotics and other urinary tract antiseptics that can be used. If symbiotic action can be proved, then the greatest field of usefulness may lie in determining the combinations that are effective in any given resistant organism, long-standing organic disease, or after radical operation with ureteral transplants and obstructive disease.

Lateral Cysts and Fistulas of the Neck

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SUMMARY

The embryonic origin of lateral cysts and fistulas remains controversial. They are, however, located in the general anatomic pattern of the embryonic thymic duct, which starts in the lateral pharyngeal wall and passes under the sternomastoid muscle to enter the mediastinum. The cyst is a unilocular, semi-attached, non-translucent mass which has a tendency to become infected in 30 per cent of cases.

The preauricular sinus occurs in front of the ear and is due either to a branchial cleft or an inclusion of one of the six primitive buds which form the external ear.

Cystic hygroma is due to sequestrated lymphatic channels. These are always multilocular and rather invasive and may extend into mediastinum and arms.

Diagnosis and treatment are considered in this presentation.

THE embryologic pathologic delineation of branchial cysts and fistulas remains controversial. There are those who believe that they are derived from a branchial cleft, chiefly the second which forms the cervical sinus. Among these are Rabl,[14] Bailey,[1] Ladd and Gross,[6] Malcolm and Benson.[11] Other investigators are more inclined to follow the teaching of Wenglowski,[15] who maintained, from observation of a large series of sections of embryos, that the lesions are the remains of the thymic duct. Among these are Lahey,[8] Meyer,[12] Larson,[10] and many others, including the author.[2, 3, 4, 5] Interestingly enough, Neal and Pemberton,[13] in a recent report on 319 cases (incidentally, the largest series ever reported by any group) cautiously did not commit themselves. It is because of this controversy that the term "lateral cysts and fistulas" has come to be used by some instead of the term "branchial or thymic duct cysts and fistulas."

It cannot be denied, however, that these lateral or branchial neck anomalies follow the general anatomic location of the embryonic thymic duct, much as thyroglossal duct cysts and fistulas are located along the pattern of the embryonic thyroglossal duct. The thymic duct leaves the lateral wall of the pharynx and descends beneath the sternomastoid muscle and comes to rest in the mediastinum. These lateral cysts and fistulas occupy a similar anatomic position (Figure 1). They should not be confused with the preauricular sinus or cystic hygroma which are entirely different entities.

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INCIDENCE

At the Los Angeles County General Hospital in the 20 years 1929-1949, diagnosis of branchial cysts or fistulas was recorded in 64 cases. The histories of 50 of the patients were available. A survey of these histories revealed that no distinction was made between the preauricular sinus and the lateral cyst or fistula. In 17 cases the lesions were preauricular and in 33 cases they could be classified as lateral or branchial cysts or fistulas.

CLINICAL PICTURE

Clinically the so-called branchial cyst usually manifests itself as a semi-fixed, uniform, painless, non-translucent swelling in the lateral side of the neck (Figure 2). The cyst is unilocular and may be as small as 1 cm. in diameter or it may almost fill the entire side of the neck. It is not attached to the skin and usually occurs in the upper third of the neck in a definite relationship to deeper portions of the anterior fibers of the sternomastoid muscle. Although the cyst may occasionally bulge posterior to that muscle, it invariably lies anterior to the carotid sheath. Distribution is equal between sexes, and between the right and left side. In one of the 33 cases of record at Los Angeles County General Hospital, both sides were involved.

The lesion may occur in persons of any age. In the series of 33 patients here reviewed, five were less than one year of age, and three of these were newborn. The oldest patient was 84 years of age. There were none between one and 10, but there were five between 10 and 20; 10 between 20 and 30; four between 30 and 40 years of age, and the remainder scattered in the older age groups. Duration also is variable. With the exception of the infant group, there was but one patient in the series, a 12-year-old boy, who had a history of the presence of a cyst since birth. The remainder had a history of duration varying from several days to many years. In a majority of cases, the lesion had existed only a few months. Trauma was not given as a precipitating factor in any case.

Ordinarily a branchial cyst will give no trouble. Complications do occur, but these are mainly due to infections, not infrequently following a sore throat. Thirty per cent of the patients in the present series had had previous infections with one to many incisions and drainage. Twenty per cent of the patients had infection at the time of admission to the hospital. Other complications also occur.

Cough due to vagal irritation has been reported. One of the patients with this complication had difficulty in breathing and swallowing because of pressure from a large cyst. In another patient, purulent thyroiditis in a nodular goiter developed a few days after an infected branchial cyst was incised and drained. Still another had brachial plexus neuritis following an infection of the cyst. Although carcinoma is occasionally reported, there were none in the present series. Likewise, Neal and Pemberton,[13] in a series of 319 cases, did not find a single instance of carcinoma. They made the statement that the diagnosis of branchial carcinoma is probably erroneous.

The incidence of branchial fistula is about one-tenth that of branchial cyst. Although it is frequently produced by ill-advised incision and drainage, true congenital fistula does occur. The opening of the fistula may occur at any level but has a definite relationship to the anterior border of the sternomastoid muscle (Figure 3). The discharge is usually a milky, mucoid material. The tract almost universally follows a course just beneath the anterior fibers of the sternomastoid muscle up to the point beneath the mid-portion of the posterior belly of the digastric muscle, where it arches medially, usually over the hypoglossal nerve, to enter the lateral wall of the pharynx in the vicinity of the tonsil (Figure 1). Because of this connection, bouts of infection following a sore throat are commonplace. Both cysts and fistulas are lined with stratified squamous epithelium on a lymphoid stroma. It is

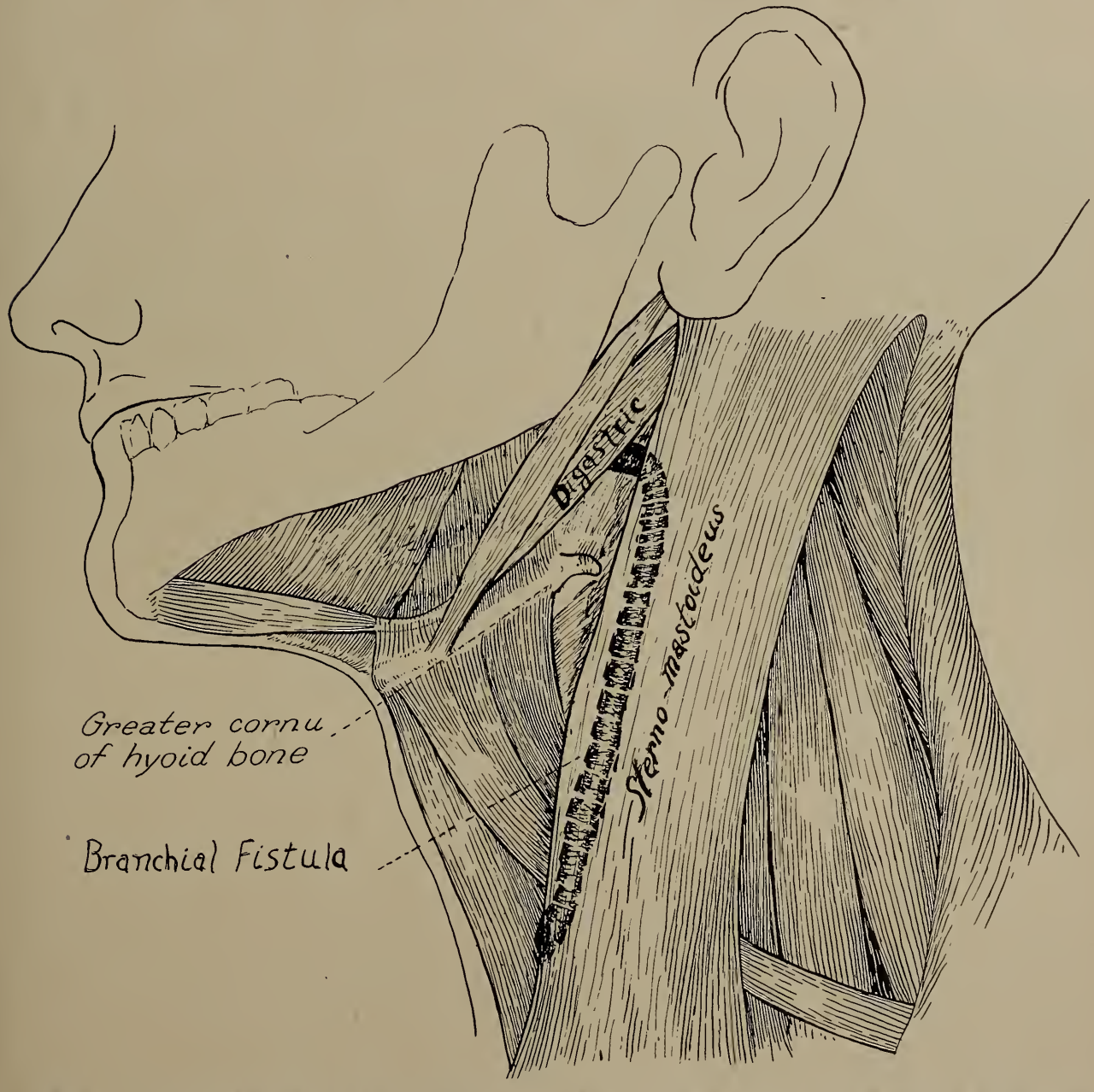

Figure 1.—Schematic drawing of anatomy of the branchial fistula. External opening is along anterior border of the sternomastoid muscle. The tract then goes beneath the cervical fascia and the anterior fibers of the sternomastoid. It passes beneath the mid-portion of the posterior belly of the digastric muscle and enters the lateral wall of the pharynx. This roughly corresponds to the course followed by the embryonic thymic duct.

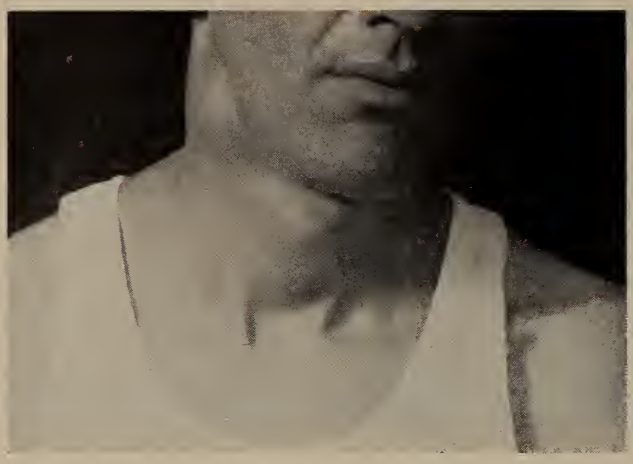

Figure 2.—Showing usual location of the branchial cyst in the upper third of the neck and in relation to the anterior fibers of the sternomastoid muscle. Branchial cyst is always unilocular.

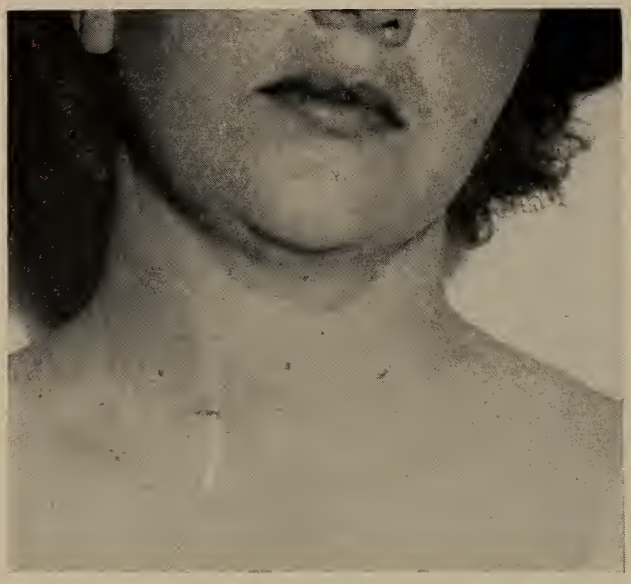

Figure 3.—Right branchial fistula, showing discharge and outline of lower portion of the tract.

the similarity of the course of the embryonic thymic duct and branchial fistula which has led many observers to believe that the fistulas are vestiges of the thymic duct and therefore should not be called "branchial fistulas" at all. The term "pharyngothymic duct cyst and fistula" would be more appropriate. The term "lateral cysts and fistulas" is strictly one of appeasement.

DIFFERENTIAL DIAGNOSIS

If there is a unilocular, non-translucent cystic swelling or fistulous tract occurring in relation to the deep anterior portion of the sternomastoid muscle, branchial cyst or fistula is probable. If aspiration yields cholesterol crystals, the diagnosis is assured.

Other lesions which must be considered in differentiation, however, are thyroglossal cysts and fistulas, carotid body tumor, dermoid cysts, inflammatory and tuberculous adenitis, aberrant thyroid material, lipoma, sebaceous cyst, neurofibroma and cystic hygroma.

Thyroglossal fistulas and cysts occur in the midline and invariably move when the patient swallows.

Carotid body tumors fortunately are rare. Only three were recorded in the Los Angeles County General Hospital in 20 years. Such tumors, as Lahey[9] has pointed out, lie deeper than do branchial cysts and fistulas. Other distinguishing features are that they may be moved laterally but not vertically, they transmit pulsation, and bruit may be present. If doubt exists, aspiration should be done, as the risk associated with the removal of a carotid body tumor is decidedly greater than that associated with the removal of a branchial cyst. The author knows of at least one instance (elsewhere) in which during operation to remove a carotid body tumor from a young patient, ligation of all carotid vessels apparently became necessary, resulting in hemiplegia. As Lahey[9] pointed out, since the danger of malignancy is not great and the operation itself is hazardous, it ought not be undertaken without careful consideration.

A dermoid cyst may not be differentiated until its contents of hair and fluid are examined. Inflammatory reaction in nearby lymph nodes is often bilateral and may involve any of numerous nodes. The involved nodes are tender, and usually the inflammation can be traced to the offending focus. Tuberculous nodes are hard and matted, the discharging sinus tract is undermined, and the discharge is caseous.

Aberrant growth of thyroid material may occur anywhere in the neck, often along the jugular group of lymphatic nodes. All such lesions are without a doubt metastatic from carcinoma of the thyroid, and careful search will reveal a palpable nodule in the thyroid gland on the ipsilateral side in a fair proportion of cases.

A lipoma is soft. As a rule it is more superficial than a branchial cyst or fistula, and if it is, the wavy contour of the overlying skin will be characteristic. Aspiration may occasionally be necessary to determine whether a cyst exists.

A sebaceous cyst is invariably superficial in the subcutaneous tissue, sometimes attached to the skin, with associated comedo.

Neurofibroma is rare. It is firm, elongated and lies along the course of a major nerve. The exact nature of the lesion may not be determined preoperatively, but the discovery (at exploration) of a nerve stalk at both ends establishes the diagnosis.

Cystic hygroma occurs most frequently in the supraclavicular area. It is always multilocular and translucent, except in those cases in which hemorrhage has occurred.

TREATMENT

Treatment of branchial fistula is by excision. The author formerly made an incision along the anterior border of the sternomastoid muscle, but now favors the more cosmetic "stepladder" incision

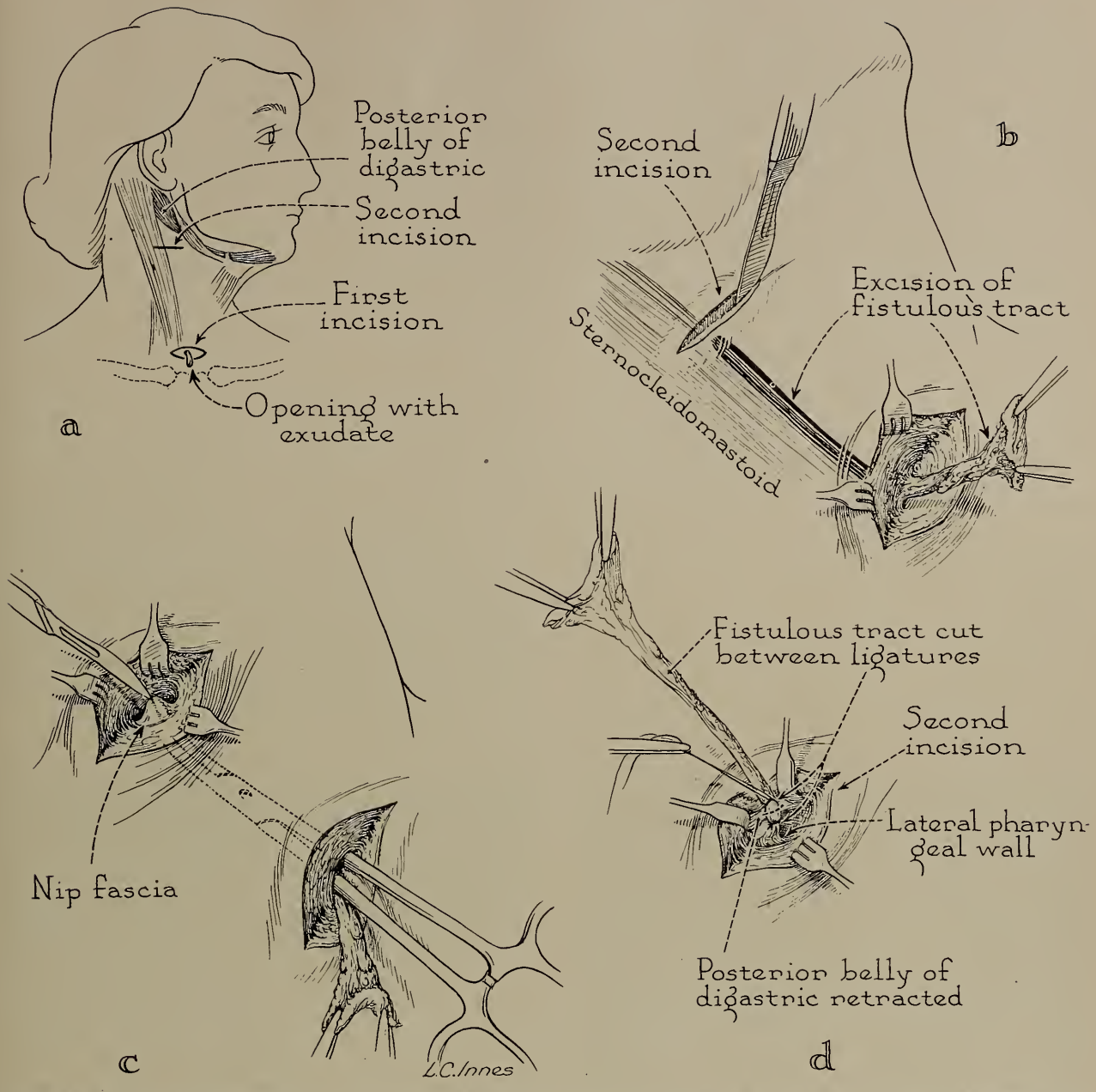

Figure 4.—Steps in excision of branchial fistula: (A) Elliptical incision around opening. (B) Tract is dissected upward as far as possible and a second incision is made (stepladder incision). (C) The tract is transferred into the upper incision. (D) Tract ligated (beneath digastric) flush with lateral wall of pharynx.

as described by Lahey[8] and Bailey.[1] In this procedure, first an elliptical incision is made around the tract, which is then dissected upward beneath the investing cervical fascia as far as possible. A second incision is then made and the tract transferred into it. Further dissection is carried beneath the digastric muscle to the lateral wall of the pharynx where the stump may be ligated flush with the pharynx (Figure 4). The author used to invert the stump into the pharynx, but the results of this tedious procedure were no better than those obtained by ligation flush with the pharyngeal wall.

A branchial cyst should be excised before infection appears. In about 20 per cent of cases infection will be present when the patient is first observed. Removal then is inadvisable — in fact technically difficult or impossible—and operation should not be carried out until the infection has completely subsided.

If the patient is in early infancy, excision may be deferred. In the present series none of the five infants less than one year of age were operated upon, although aspiration was done in one case. Old age itself should be no deterrent to excision. None of the four patients over 60 years of age in the Los Angeles County General Hospital series was operated upon, but in all four there was pronounced evidence of cardiovascular disease.

Treatment of the group between old age and infancy was as follows: Excision was performed on all five of the group between 10 and 20 years of age. In the group of 10 patients between 20 and 30 years

of age, one was not operated upon because of severe asthma. Two were admitted three times for incision and drainage of an infected cyst, and excision was finally carried out. In one case, incomplete removal of an inflamed cyst was followed by brachial plexus neuritis which led to exploration of the brachial plexus by a neurosurgeon. The remaining six patients in that age group had primary excision. Primary excision of the cyst was done in all four patients between 30 and 40 years of age. Of the five patients between 40 and 60 years of age, one had pronounced dyspnea caused by pressure of a large cyst. Partial relief followed aspiration, and a few days later the cyst spontaneously discharged into the pharynx with complete relief. The patient was readmitted three years later with carcinoma of the cervix of the uterus, and at that time no note of abnormality in the neck was made in the history or in the record of physical examination. One patient in this age group had an infected fistula leading into a cyst. Following incision and drainage, purulent thyroiditis developed in a nodular goiter, and the involved lobe was resected. One patient was not treated. Two had primary excision. There were no deaths.

For removal of the branchial cyst the author prefers a horizontal incision in a crease of the skin, with the skin flaps reflected well beneath the platysma muscle. The cervical fascia is then incised along the anterior border of the sternomastoid muscle. The approach should always be in front of the muscle even though the cyst may bulge posteriorly, as the cyst always extends anteriorly to the carotid sheath. It may be necessary to reflect the sternomastoid muscle considerably laterally, or even to section a portion of it, but this is less hazardous than a posterior approach which first encounters the carotid sheath. An infected cyst should never be removed; operation should be withheld until several months after all inflammation has subsided and a line of cleavage between cyst wall and surrounding tissue has become established. In three instances operation was done too early, inflammatory reaction was encountered and no line of cleavage could be made. In these circumstances the cyst wall was simply opened, touched with iodine, and packed with gauze which was periodically replaced for a period of several weeks. In one case destruction of the wall of the cyst had evidently been complete, as there was no recurrence of the lesion in 18 months. In the other two cases, the cyst recurred within a few months after the packing had been removed. A definite line of cleavage was then found and total excision was possible (Figure 5). In the acutely inflamed stage antibiotics and compresses should be used. Aspiration may suffice to relieve pressure in some cases but in others incision and drainage will be necessary.

Figure 5.—Branchial cyst which at previous operation was inflamed with no line of cleavage, was packed and three months later excised with a portion of skin. Line of cleavage readily found after all inflammation had subsided.

Figure 6.—Preauricular sinus with excoriation of skin from prolonged discharge.

PREAURICULAR SINUS

In cases in which a preauricular sinus occurs, the abnormality is invariably present at birth. The opening is usually in front of and at a level with the upper portion of the ear (Figure 6). Inasmuch as the tract is lined with epithelium and containing vestiges of skin, sweat glands, sebaceous glands and hair follicles, there is often secretion of sebaceous debris deep in the tract. This may result in resistant infection, abscess and cellulitis. The condition may be noted in early infancy and childhood. In the present series there were ten patients with this entity. Six of them were less than seven years of age. One of them was only six months and another seven months of age. The majority of the older children had history of recurrent bouts of infection, some with previous incision and drainage. In three cases the lesions were bilateral; and in one of these there was also bilateral (so-called) branchial fistula of the neck. Only one other patient, however, had other congenital anomalies—accessory thumbs.

Figure 7.—Cystic hygroma in usual location of supraclavicular area. It is soft, multilocular, translucent and contains a clear straw-colored material.

Such sinuses should be excised before infection sets in. Often, however, severe infection is present when the patient is first observed. In such cases there must be a period of preliminary treatment with compresses, antibiotics and diligent removal of the debris from the tract or incision and drainage of an abscess.

Two of 16 patients with preauricular sinus in this series were not treated. One was treated only with compresses. Three were treated with compresses followed by incision and drainage of an abscess. In nine cases excision was carried out. In one case excision was attempted but was not successful.

Whether these tracts originate from the first branchial cleft or from inclusion of the primitive six nubbins that form the external ear, they would not be expected to go deep and should stop at about the level of the membrana tympani. In the present series, most tracts went directly inward, ending about at the level of the ear drum and in close relation to the external auditory canal, although in one case the tract was described as going directly into the parotid gland and in another as going directly beneath the zygoma.

Figure 8.—Cystic hygroma filling entire neck and mediastinum (cervicomediastinal cystic hygroma).

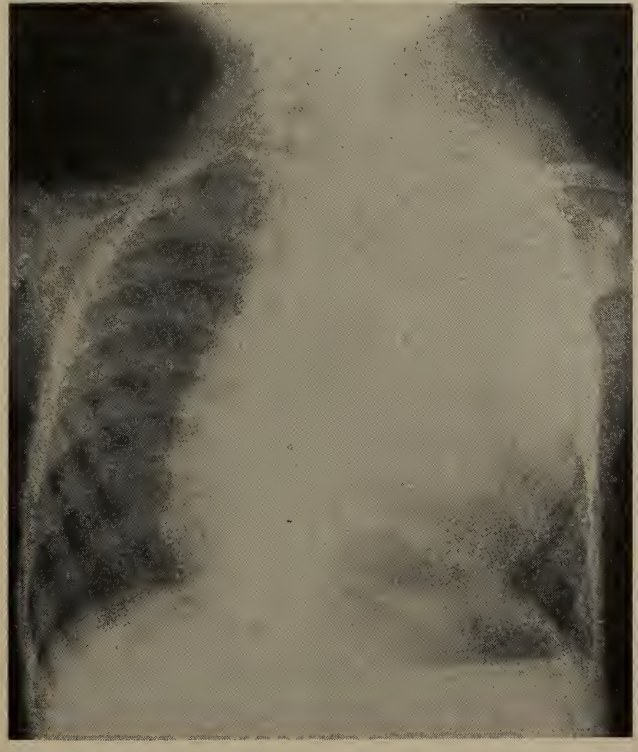

Figure 9.—X-ray view of chest of infant shown in Figure 8 shows extensive involvement of mediastinum and left chest.

Figure 10.—Cystic hygroma involving not only right supraclavicular space but also entire arm and axilla.

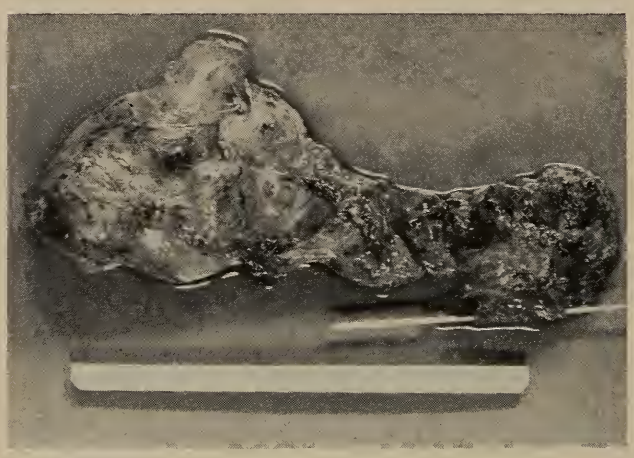

Figure 11.—Cystic hygroma specimen from the neck, showing multilocularity and tendency to insinuate around important structures. Note probe in internal jugular vein.

CYSTIC HYGROMA

Cystic hygroma is much less common than the branchial cyst. Reports of only five could be found in the records for the past 20 years at the Los Angeles County General Hospital.

Cystic hygroma is caused by sequestration of embryonic lymphatic vessels. It manifests itself at or shortly after birth as a soft multilocular, translucent, cystic swelling which is usually located in the supraclavicular area (Figure 7), although it may be found anywhere in the body. Clumps of cystic masses may be extended across the entire neck (Figure 8) and down into the mediastinum (Figure 9) causing obstructive dyspnea. Extension down the arm may occur, causing not only disfigurement but also disability (Figure 10). The cystic mass is filled with a straw-colored material, and hemorrhage into some of the cysts is commonplace. Diagnosis is usually made from the location and the usual multilocularity, translucency, and the presence of straw-colored material. Although excision is the only possible method of relief, the surgeon and the patient's family must be forewarned that removal of the more complicated lesions is not a simple procedure. The multilocular cysts and surrounding fibrous trabeculae have a tendency to insinuate between or to surround important structures (Figure 11).

In cervicomediastinal hygromas the portion in the neck should be removed first, as occasionally a great part of the mediastinal projection can thereby be relieved (Gross and Hurwitt[7]).

Complete removal may be simple in some cases, in others difficult or technically impossible. Because of possible mediastinal involvement, roentgen study of the chest should be done in all cases of cystic hygroma.

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The Use of Raw Foods as Skin Testing Material in Allergic Disorders

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SUMMARY

Frozen foods for skin testing were prepared, stored and used by a simple, practicable, and inexpensive method.

The capacity of raw foods to produce immunologically positive skin reactions by the scratch test method was reaffirmed.

Storage in the frozen state for several months and thawing immediately before using for one series of tests did not affect the allergenic properties of the material.

Raw foods were found to be innocuous to the skin and non-urticariogenic in allergic as well as in non-allergic persons.

Raw foods, by the scratch test method, induced true positive reactions of a larger size and in greater numbers than the corresponding commercial extracts in the same series of subjects tested.

IT has been repeatedly demonstrated that skin tests to determine sensitivity to specific foods in cases in which allergic reaction to foods is clinically obvious are not satisfactory: Often in the presence of food sensitivity, well established by history and clinical trials, reaction to skin test is negative; often positive reactions, the clinical value of which cannot be proved, are elicited.

The reason for this is not entirely understood. One important factor is the variation in the content of the specific antigens present in most of the testing materials. It may be that in the preparation of the extract insufficient amounts of the allergenic portions of the foods are concentrated into it. Or it may be that some of the antigenic fractions are destroyed or are not maintained in an active state. This latter point was clearly demonstrated by Tuft and Blumstein[2, 3] who showed in 1942 that the standard extracts made from fruits lacked a thermolabile fraction capable in some cases of inducing clinical symptoms and different from another fraction which was thermostabile. This thermolabile antigenic fraction was present in the fresh and rapidly frozen material, was greatly reduced by Seitz filtration, was destroyed by heat in canning or cooking, and disappeared in three to four days at usual refrigeration temperature.

Strauss and Spain[1] stated that "the more completely the antigen in the extract form retains the characteristics which it possesses in the natural state . . . the more precise and the more accurate the cutaneous test will be. Indeed, it would be ideal if it were possible to perform the tests with the antigens in their natural fresh state or original condition."

Impracticable in the past, except in occasional instances, this has become easy to do with the advent and common use of the freezing units. The authors have developed a simple and inexpensive method for the preparation, storage and application of foods as skin-testing materials.

Each food was collected in the fresh state and according to its physical properties reduced to a powder or to a pulp. An electric blender was found most useful for the purpose. The material was divided into shell vials of 2 cc. capacity, closed by clean cork stoppers and immediately stored in a freezing compartment.

Later, small packages were assembled into units containing a complete series of the different foods. A few minutes before the material was to be used for testing, a package was removed from the freezer for thawing. Scratch tests were performed employing one-tenth normal sodium hydroxide or one-fiftieth normal sodium hydroxide with 30 per cent glycerin as a moistening agent. Remnants of the test material were discarded.

Fifty-one foods were chosen as representing generally the important members of the zoological and botanical groups commonly used in the authors' locality. They were:

Beef	Rice	Potato
Chicken	Corn	Tomato
Lamb	Buckwheat	Carrot
Pork	Cinnamon	Celery
Egg	Vanilla	Pineapple
Cow's Milk	Black Pepper	Cantaloupe
Sea Bass	Ginger	Banana
Halibut	Lettuce	Coconut
Salmon	Spinach	Apple
Sole	Cabbage	Almond
Crab	Mustard	Peach
Shrimp	Lima Bean	Strawberry
Clam	Soy Bean	Orange
Oat	Green Pea	English Walnut
Barley	Peanut	Cocoa
Rye	Garlic	Coffee
Wheat	Onion	Tea

Scratch tests were made with the frozen food materials and with one to three different brands of

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reputable commercial extracts, all at the same time and on homologous sites on the skin. It was confirmed that raw foods have the capacity to produce by the scratch method immunologically positive skin reactions. Moreover, such testing materials proved to be innocuous to the skin and non-urticariogenic in allergic as well as in non-allergic persons. There were slight erythematous reactions to a few foods, such as spinach and tomato, but they did not constitute a difficulty in the interpretation of the reactions.

Storage in the frozen state for several months and a single thawing immediately before use for one series of tests did not affect the allergenic properties of the materials.

Comparative studies were carried out in 66 persons, the majority of whom had allergic diseases of various types. Forty-three of the subjects had entirely negative reactions to scratch tests with both types of materials. Twenty-three had positive reaction to at least one food in tests with one or another of the preparations. In this group it was demonstrated that fresh frozen foods, used as testing material by the scratch method, induced true positive reactions of a larger size and in a greater number of the subjects than did the corresponding commercial extracts (Table 1).

Of the 51 foods used in the tests, 41 elicited positive or doubtful reactions in at least one of the 23 subjects. The total number of reactions to frozen food preparations was 140 (128 positive, 12 doubtful), against 84 reactions (58 positive, 26 doubtful) by the same subjects to standard extracts.

There were only 12 instances in which the reaction to a frozen food was negative when the reac-

TABLE 1.—*Results of Comparative Scratch Tests of Frozen Foods and Commercial Extracts in the 23 Patients Who Had Positive Reactions*

Foods	Subjects with Positive or Doubtful Reaction	Reaction to Frozen Materials				Reaction to Standard Extracts			
		Positive	Doubtful	Negative*	Points†	Positive	Doubtful	Negative*	Points†
1. Shrimp	14	14	....	....	41	3	3	8	4.5
2. Crab	10	8	2	....	24	3	2	5	4
3. Pea	9	8	1	....	26	3	1	5	6.5
4. Sole	7	6	1	....	19.5	2	1	4	5.5
5. Peanut	7	6	1	....	19.5	....	2	5	1
6. Sea bass	6	6	....	....	18	....	2	4	1
7. Clam	6	6	....	....	16	1	2	3	2
8. Rice	5	3	1	1	7.5	3	....	2	3
9. Rye	5	4	....	1	11	2	3	....	4.5
10. Wheat	5	3	1	1	9.5	3	1	1	6.5
11. Cabbage	5	5	....	....	10	2	....	3	5
12. Potato	5	3	2	....	8	1	2	2	5
13. Tomato	5	4	....	1	6	2	....	3	5
14. Banana	5	4	1	....	10.5	....	1	4	0.5
15. Halibut	4	4	....	....	11	1	1	2	2.5
16. Salmon	4	3	1	....	10.5	3	....	1	3
17. Barley	4	4	....	....	10	1	1	2	2.5
18. Buckwheat	4	4	....	....	10	2	1	1	5.5
19. Corn	4	3	....	1	6	2	1	1	5.5
20. English walnut	4	4	....	....	15	3	....	1	7
21. Celery	3	1	....	2	1	2	1	....	7.5
22. Garlic	3	2	....	1	5	1	1	1	1.5
23. Onion	3	3	....	....	4	1	....	2	3
24. Oat	3	3	....	....	7	3	....	....	7
25. Lima bean	3	3	....	....	9	2	....	1	7
26. Mustard	2	2	....	....	8	1	....	1	4
27. Spinach	2	....	....	2	0	2	....	....	6
28. Almond	2	2	....	....	2	2	....	....	6
29. Egg	1	1	....	....	4	1	....	....	4
30. Milk	1	....	....	1	0	1	....	....	1
31. Chicken	1	....	1	....	0.5	....	....	1	0
32. Pork	1	1	....	....	1	....	....	1	0
33. Pepper, black	1	1	....	....	2	....	....	1	0
34. Coffee	1	1	....	....	1	....	....	1	0
35. Cantaloupe	1	1	....	....	2	1	....	....	1
36. Coconut	1	1	....	....	1	....	....	1	0
37. Orange	1	1	....	....	3	....	....	1	0
38. Peach	1	1	....	....	1	1	....	....	3
39. Pineapple	1	....	....	1	0	1	....	....	1
40. Strawberry	1	1	....	....	3	1	....	....	3
41. Soy bean	1	1	....	....	1	1	....	....	4
	152	128	12	12	344.5	58	26	68	143

*Under the heading "Negative" are included those instances in which the test was negative to either the frozen food or commercial extract when positive or doubtful with the other.

†"Points" are based on a value of 0.5 for a doubtful positive and 1 to 4 for the positive, the value depending upon the degree of reaction—1+ to 4+.

TABLE 2.—*Comparison of the Degree of Positive Reactions to Frozen and Standard Extracts of Shrimp in 14 Patients*

	Fourteen Subjects													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Frozen	1+	1+	2+	4+	3+	4+	1+	4+	1+	4+	4+	4+	4+	4+
Standard	0	?+	1+	0	0	0	0	1+	0	0	0	0	?+	1+

tion to a standard extract was positive or doubtful; whereas there were 68 instances of the converse.

The predominantly larger size of reactions to the frozen foods as compared to the commercial extracts is represented in Table 1 by the use of a grading system of points in which doubtful reactions receive a value of 0.5 point and positive reactions are valued 1 to 4. On this basis there were 344.5 points for the frozen foods as against 143 for the commercial extracts.

As an example of the difference in potency between frozen and commercial testing materials, a tabulation of the results of skin testing in the 14 patients sensitive to shrimp is presented in Table 2.

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Salicylazosulfapyridine (Salazopyrin or Azopyrin) in Rheumatoid Arthritis and Experimental Polyarthritis

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SUMMARY

Thirty patients with rheumatoid arthritis were treated with Salazopyrin® for periods from two months to one year.

Fourteen patients were symptomatically relieved in varying degrees. This group included seven patients not previously benefited by gold therapy and four who had had toxic reaction to gold. The sedimentation rates tended to remain elevated in spite of symptomatic improvement. Extension of disease to joints not formerly involved appeared in only one patient under treatment.

Continuation of small dosage for long intervals seemed advantageous in the small number of patients treated in this study.

Fourteen patients were not relieved symptomatically by Salazopyrin, but they did not become worse. This group included eight patients with severe, advanced disease, six of whom had not been benefited by chrysotherapy.

In one patient there was a moderate reduction in erythrocyte count and in hemoglobin. One patient refused medication, claiming extreme nervousness.

Salazopyrin is variably and comparatively poorly absorbed in man.

In experimental polyarthritis of rats, administration of 0.5 per cent Salazopyrin in the diet produced a slight beneficial effect, while 1 per cent made the infection worse. Changes in body weight and in leukocyte content in the blood of rats and mice showed Salazopyrin to have minimal toxic effect in these rodents.

THE sulfonamides have been extensively tried in the treatment of rheumatoid arthritis. In general, their use has been found ineffective in altering the course of the disease. There are, however, two notable exceptions in which the use of sulfonamides has been favorably reported. Parr and Shipton[6, 7] working in Australia reported the favorable effect of benzylsulfanilamide (proseptasine) in rheumatoid arthritis, in 1947, and again in 1949. Svartz, working in the Caroline Institute in Stockholm with the collaboration of the chemists Askelöf and Willstaedt, developed a di-azo dye, the formula of which is 4-(pyridyl-2-amidosulfonyl)-3′-carboxy-4′-hydroxy-azobenzene. This dye, known by the trade names Salazopyrin® and Azopyrin,® has been reported to be effective in the treatment of rheumatoid arthritis[10] and ulcerative colitis.[1, 12] The use of the sulfonamides and salicylates concurrently gave no favorable result, but it was postulated that a di-azo compound containing both of these substances might be deposited in heavy concentration in the connective tissue where the primary pathological involvement was apparent.

Salicylazosulfapyridine is a brownish yellow dye which is almost insoluble in water and other solvents. It is absorbed from the intestinal tract and partly broken down in the tissues and partly excreted in the urine as such. Its concentration in the urine may be determined colorimetrically, since in alkaline urine its presence gives rise to a bright orange-yellow color. In acid urine the dye causes no change in color. Svartz claims that the drug, when broken down, forms small amounts of aminosalicylic acid and sulfapyridine. Helander has shown that Salazopyrin, like other acid-azo compounds, has a special affinity for the connective tissues in mice,[5] as shown by fluorescent microscopy.

The purpose of the present study has been to determine the therapeutic value of Salazopyrin in rheumatoid arthritis of various degrees of severity and in the experimental polyarthritis (produced by L-4 strain of the pleuropneumonia-like organism) of rats, and to determine possible toxic effects in man, rats and mice.

THERAPEUTIC RESULTS IN RHEUMATOID ARTHRITIS

Thirty patients with rheumatoid arthritis of varying duration and severity were treated with Salazopyrin. Fourteen of these patients showed some measure of clinical improvement following the use of the

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TABLE 1.—*Summary of Cases in Which Improvement Was Shown on Salazopyrin Therapy*

Patient	Sex	Age	Duration of Symptoms (months)	Extent of Disease Prior to Treatment	Sed. Rate Before Treatment (mm. per hr.)	Daily Dosage and Duration of Salazopyrin Therapy	Symptoms of Toxicity	Status After Treatment	Sed. Rate After Treatment (mm. per hr.)
1.	F	29	12	Morning stiffness, swollen wrists, knees and ankles, unable to work.	34	4 gm. 3 wk.; then 3 gm. 12 wk.; then none for 2 wk.	Slight nausea, dizziness, thirst, restlessness.	Pronounced improvement in 1 wk.; after 4 mo. only slight morning stiffness of hands; now working.	30
2.*	M	29	60	Moderate ankylosing spondylitis with pain and swelling in hands, knees and shoulders; working.	21	4 gm. 2 mo.; then 2 gm. 10 mo.	Nausea relieved by sodium bicarbonate.	Less fatigue, less pain and stiffness, no extension of disease; working.	15
3.*	M	32	18	Moderate ankylosing spondylitis with great pain and swelling, knees and wrists, unable to work.	36	2 gm. 6 wk.; none 3 wk.; 1.5 gm. 3 mo.	Decrease in R.B.C. and Hgb. after 6 wks.	Gain in wt.; less stiffness and swelling; generally better; working; 2 new joints involved.	44
4.	F	64	36	Mixed arthritis, swollen, painful knees, able to do housework.	30	3 gm. 2 wk.; then 1.5-2.0 gm. 4 mo.	Drowsy, sleepy and nauseated on the higher dosages.	Asymptomatic; working.	23
5.*	M	27	252	Ankylosing spondylitis with swollen knees and wrists; able to walk and do little work.	30	4 gm. 6 wk.; 3 gm. 2½ mo.	None.	Pronounced improvement; weight gain; less tired; no swelling of knees; working full time.	26
6.*	F	38	120	Pronounced morning stiffness, pain in hands, shoulders and left hip; working.	46	2-2.5 gm. 6 mo.; then 3 gm. 2 wk.; then 1.5 gm. daily 4 mo.	Nausea relieved by sodium bicarbonate.	Moderate improvement; less stiff and tired, less pain; no progression of disease; working.	30
7.*	M	53	168	Ankylosing spondylitis with involvement of wrists, shoulders, hands, knees, feet; not working.	48	2.0 gm. 6 wk.; 3 gm. 1 mo.; 2 gm. 4 mo.	Nausea after large doses.	Gained 10 lbs.; less tired and stiff; greater range of motion; working.	30
8.†	F	57	48	Mixed arthritis, great pain, wrists, knees, feet and hips; unable to work.	40	2 gm. 2 mo.	None.	No pain; slight morning stiffness of hands; doing housework.	32
9.	F	31	72	Early involvement sacro-iliac, pain in hips and shoulders; working.	17	1.5 gm. 2 days; 0.25 gm. 1 wk.; 3 gm. 2 mo.	Occasional nausea.	More energy; less stiffness; less pain in back and joints; working.	12
10.*	F	29	24	Severe generalized rheumatoid arthritis with marked pain and stiffness; able to walk.	24	0.25 gm. 1 wk.; 3 gm. 1 mo.; 2 gm. 7 mo.	None.	Gained 15 lbs.; still has considerable pain, but no swelling; good range of motion; little stiffness; not enough rest; does housework.	34
11.†	F	51	54	Mild rheumatoid arthritis with hands, one shoulder and ankle involved; working.	24	4 gm. 1 mo.; 3 gm. 3 mo.; 2 gm. 9 mo.; none for 3 mo.	Slight dizziness after higher doses.	Rapid striking relief of symptoms; no swelling or pain; little stiffness; working.	18
12.†	M	40	180	Pronounced morning stiffness, pain and swelling knees, hands and shoulders; working.	40	2 gm. 1½ mo.; 3 gm. 4 mo.; 1 gm. 7 mo.	Occasional nausea.	Symptom-free; working.	?
13.*	M	24	18	Pronounced joint deformity, pain, swelling, all joints involved; in bed.	38	4 gm. 2 mo.; 3 gm. 9 mo.	Slight nausea after larger doses.	Gain in wt. and strength; no progression; less stiffness; greatly improved; walks daily.	21
14.†	F	24	60	Ankylosing spondylitis and swelling of knees, ankles and wrists; working.	12	2 gm. 2 mo.	None.	Feels warmer; less fatigue; less swelling and pain; working.	?

* No benefit from previous gold therapy.

† Benefited symptomatically by previous gold therapy but toxic reaction to gold developed.

drug. In 16 other patients the drug was discontinued either because of lack of clinical response or because of varying degrees of toxic reaction.

Table 1 shows brief summaries of the cases in which the patients were improved while taking Salazopyrin. The duration of therapy varied from two to 12 months. With one exception all patients are still on small maintenance doses of the drug, usually 1.0 to 2.0 gm. daily. Due to difficulties in the supply of Salazopyrin, there were two intervals of three weeks each during which most of these patients received no therapy other than salicylates. During these intervals all patients became worse symptomatically and showed much more stiffness, pain and joint swelling. The nausea which developed on higher doses in these cases was minimal and was relieved by sodium bicarbonate. These patients all noted pronounced improvement within the first seven to 14 days of therapy. They had all been taking large quantities of salicylates prior to the Salazopyrin, and after several days most of them did not have to take salicylates. Eleven of these patients had received previous chrysotherapy. Four of them had shown improvement with gold but toxic reactions necessitated its discontinuance. Seven of them showed no benefit from previous gold therapy. In none of these cases was there any obvious "focus of infection" from which streptococci or other bacteria were cultured.

In another group of 14 patients the use of Salazopyrin was without any demonstrable benefit. This group included eight patients with severe advanced rheumatoid arthritis (one of these was later relieved of symptoms with ACTH and cortisone). Six of these eight patients had shown no benefit with prolonged chrysotherapy and two of them had to give it up because of toxic reactions. In this group of 14 patients there were also three with mild mixed arthritis of the knees and hips, one with early ankylosing spondylitis, and two with early typical rheumatoid arthritis. Among the patients in this group there was little evidence of toxic reaction to Salazopyrin except for nausea when the daily dosage exceeded 3 gm. In one case a skin rash developed but it subsided on withdrawal of medication. This was not accompanied by a reduction in erythrocytes in the blood.

Two other patients were given Salazopyrin. One woman, aged 57, who had rheumatoid arthritis of 20 years' duration refused Salazopyrin after two days because of "nervousness" which developed subsequent to its use. In the other case, that of a woman, aged 27, who was taking 3 gm. of Salazopyrin daily, there was a reduction in erythrocytes in the blood from 4,920,000, with 15.5 gm. hemoglobin, to 3,860,000 with 12.4 gm. hemoglobin, in eight days. Withdrawal of Salazopyrin and the use of liver extract parenterally was followed by an increase in erythrocytes to former levels in two weeks. This was the only evidence of toxic effect on the hematopoietic system in any of the 30 cases in this study.

CLINICAL TOXICITY

With the exception of the single case of decreased erythrocyte count and hemoglobin, there was no change in the blood picture in these 30 cases. There was generally a decrease in the per cent of banded young forms of polymorphonuclear neutrophils coincident with clinical improvement.

Several patients complained of restlessness and sleeplessness while taking 3 gm. or more of Salazopyrin daily. Mild nausea was the principal toxic manifestation; it occurred in all patients. In one case skin rash developed; it promptly disappeared when medication was discontinued.

BLOOD LEVELS OF SULFAPYRIDINE AND SALICYLATE

Blood levels of sulfapyridine and salicylate were determined in several patients (Table 2). Relating these blood levels to dosage revealed uneven absorption varying with the individual. In one patient given 2.5 gm. of Salazopyrin daily there was no demonstrable sulfapyridine or salicylate in the blood, while in another patient a sulfapyridine blood level of 4.0 mg. was obtained on a daily dosage of 4.0 gm.

TABLE 2.—*Blood Levels of Sulfapyridine and Salicylate in Patients Taking Salazopyrin*

Sex	Daily Dose (gm.)	Interval Between Medication and Test (hours)	Sulfapyridine Blood Level (mg./100 cc.)	Salicylate Blood Level (mg./100 cc.)
F	3.0	4	1.3	7.0
M	2.5	3	0	0
F	3.0	3	0.8 mg.	0
F	3.0	3	2.2	not determined
F	4.0	2	4.0	not determined
F	3.0	3	1.1	not determined
F	1.5	2	0.55	not determined

EFFECTS OF SALAZOPYRIN IN POLYARTHRITIS OF RATS

Salazopyrin was ground into the food (Purina Laboratory Chow®) of albino rats averaging 60 to 80 gm. in body weight. The rats were given intraperitoneal injections of the L-4 strain of pleuropneumonia-like organism which produces a polyarticular arthritis in five to seven days. Arthritis of this type in rats has been used as a method of testing various chemotherapeutic agents in relation to gold salts which will prevent or cure this arthritis.[2, 8, 13]

Scoring the effect of the medication includes three factors—survival rate, incidence of arthritis, and the maximum average arthrogram score. The arthrogram is a scoring device permitting the assignment of numerical values corresponding to the extent of the joint involvement.[14] The maximum average is computed by dividing the number of rats in the group into the total of the individual arthrograms on the day of most extensive joint involvement.

Table 3 shows the effect of Salazopyrin on the polyarthritis of rats. A dosage of 0.5 per cent Sal-

TABLE 3.—*Effect of Salazopyrin on Polyarthritis of Rats*

Trial	Concentration in Diet (per cent)	No. of Rats	Max. Avg. Arthrogram Score	Incidence (per cent)	Survival (per cent)
A	0.5	20	2.07	66	95
A	0 (control)	20	2.15	77	64
B	1.0	20	1.95	75	100
B	0 (control)	20	1.15	50	95
C	1.0	20	1.5	50	100
C	0 (control)	20	0.87	35	100
D	3.0	20	0.4	26.5	95
D	0 (control)	20	0.2	10	100

azopyrin in the diet showed a mild beneficial effect in decreasing the incidence of arthritis, increasing the survival rate and slightly decreasing the maximum average arthrogram score. A dose of 1 per cent in two separate experiments showed that in the treated animals the incidence of arthritis was higher and the disease more extensive. Separate control values are presented for each group, since the pathogenicity of the microbes varies from one sub-culture to another.

TESTS FOR TOXIC EFFECTS OF SALAZOPYRIN

Body Weight Changes in Rats and Mice. Five albino male rats (average weight 92.2 gm.) and five albino female rats (average weight 96.6 gm.) were placed on 1 per cent Salazopyrin ground into the diet. Five males (average weight 94.8 gm.) and five females (average weight 94.8 gm.) were placed on the regular diet (Purina Laboratory Chow). After an interval of 69 days the males taking Salazopyrin averaged 215 gm. in weight and the females 152 gm. The male controls averaged 236 gm. and the female controls 167 gm.

Five male albino mice (average weight 18.6 gm.) and five females (average weight 17.4 gm.) were placed on 1 per cent Salazopyrin ground into the diet. Five male controls averaged 17.4 gm. body weight and the five female controls averaged 16.2 gm. After 18 days the males on Salazopyrin averaged 30.5 gm. in body weight and the females 24.0 gm. Those on the regular ground diet (Purina Laboratory Chow) averaged 26.2 gm. for the males and 32.4 gm. for the females.

Blood Sulfapyridine Level in Rats. A determination of the blood sulfapyridine level on the pooled blood of four rats on the 1 per cent Salazopyrin diet showed a concentration of 1.029 mg. per 100 cc.

Blood Counts. Rats on 1 per cent Salazopyrin diet showed the following average leukocyte counts:

	Males	Females
13th day on Salazopyrin	16,800	11,920
(Controls)	12,000	11,920
68th day on Salazopyrin	18,400	13,080
(Controls)	15,500	15,100

Mice on 1 per cent Salazopyrin diet showed the following average leukocyte counts:

	Males	Females
121st day on Salazopyrin	13,025	9,787
(Controls)	6,760	4,285

Differential blood cell counts averaged as follows for the rats on 1 per cent Salazopyrin diet:

13th day on the diet (per cent):

	Salazopyrin Males	Salazopyrin Females	Control Males	Control Females
Neutrophils	9	9	10	12
Eosinophils	0	1	0.5	0.5
Basophils	0	1	0.5	0.5
Lymphocytes	91	85	82.0	86
Monocytes	0	4	7.0	1

68th day on the diet (per cent):

	Salazopyrin Males	Salazopyrin Females	Control Males	Control Females
Neutrophils	9	6.6	17.0	23.0
Eosinophils	1	0	5.5	1.0
Basophils	0	0.4	1.5	1.0
Lymphocytes	89	92.6	73.0	75.0
Monocytes	1	0.4	3.0	0

The average differential blood cell counts on the mice medicated with 1 per cent Salazopyrin for 121 days are given below:

	Salazopyrin Males	Salazopyrin Females	Control Males	Control Females
Neutrophils	12.5	21	18	11.8
Eosinophils	0	0	0	0
Basophils	0	0	0	0
Lymphocytes	85.5	77.5	80	86.4
Monocytes	2.0	1.5	2	1.8

In the rats after 68 days on Salazopyrin the neutrophil counts averaged about one-half to one-third those of the unmedicated controls. The percentage of lymphocytes was slightly higher among those rats treated than among the controls. In the mice after 121 days on Salazopyrin the treated males showed fewer neutrophils than the controls and the females showed more than the controls.

COMMENT

While the cause of rheumatoid arthritis has not been determined, a number of agents have been employed empirically with variable success in moderating its severity. Cortisone acetate and ACTH have been used recently with considerable success in altering the so-called rheumatic state in man, but the mechanism of the action of these agents is not yet fully understood. The use of chrysotherapy in typical rheumatoid arthritis is also often followed by remissions in the severity of the disease. Recently two salts of copper have been advocated by Forestier and his associates in the treatment of this disease.[3] In the published reports on benzylsulfanilamide and Salazopyrin[6, 7, 10, 11, 12] some therapeutic merit is also claimed. A recent study of Salazopyrin made in England by Sinclair and Duthrie[8] in 20 cases of rheumatoid arthritis resulted in the conclusion that the drug was of no specific use in the disease. The difference between that conclusion and the results of the study herein reported may have been due to the fact that in the present study the dosage was smaller and was continued for longer

periods. Sinclair and Duthrie also noted little toxic reaction to the drug. A further observation was that the accelerated sedimentation rate did not tend to return to normal under treatment.

The picture is confusing when agents of such varying composition seem capable of altering the course of rheumatoid arthritis. In this confusion it is not wise to shift all the emphasis of current research to evaluation of the hormones which are so spectacular in their effect on the disease. The implication that certain heavy metals and sulfonamides may, in some way, produce an effect similar to in kind but of different degree than that produced by these hormones indicates the desirability of studying the mode of action of these agents. Salazopyrin does not produce as many remissions as does chrysotherapy, but it is much less toxic, and, when its beneficial effect is manifest, the result seems more prompt.

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The Treatment of Acute Infections of the Hand

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SUMMARY

Acute infections of the hand are serious and frequently arise from a trivial wound which has been neglected or improperly treated. Accurate diagnosis, prompt institution of treatment, and early restoration of function are essential for successful treatment. Results in the treatment of acute infections of the hand are greatly improved by the rigid practice of a method of operation which recognizes fundamental surgical principles.

ACUTE infections of the hand are always serious. They all too frequently arise from a neglected or improperly treated trivial lesion, such as a scratch, a tiny puncture wound, or an infected callus. Secondary infection must be constantly guarded against. Infections due to organisms which are acclimated to growth in human tissues are rapidly invasive and extremely destructive. The crippling and disability which frequently result may be extreme and may seriously affect the earning capacity of the individual.

GENERAL CONSIDERATIONS

When a surgeon assumes the responsibility for treating an acute infection of the hand, he must first determine whether the infection is localized or is a spreading infection such as a cellulitis or lymphangitis. In the spreading infections, operation is contraindicated and treatment must be confined to conservative measures. In the localized infection, immediate drainage is indicated. Prior to operation the exact anatomical location of the infection must be determined. On the basis of anatomical pathways, the possible routes of spread must be visualized and anticipated. It should be stressed that delay in the prompt institution of treatment, either conservative or radical, may jeopardize the patient's hand and, indeed, his life.

FUNDAMENTAL SURGICAL PRINCIPLES

The results in the treatment of acute infections of the hand have been greatly improved by the practice of a method of operative procedure which rigidly observes certain fundamental surgical principles. These principles have been clearly stated by Koch,[8-15] Mason,[18-26] and Allen,[1] and are as follows:

Preparation of the Field of Operation

The preparation of the field of operation should not cause pain or add injury. It is the authors' routine to prepare the skin by gentle cleansing with bland white soap, sterile water and cotton for a ten-minute period. Following this cleansing, the area is lavaged with sterile saline solution. Coarse brushes, soap tinctures and chemical antiseptics are not used as they frequently have an irritating and oftentimes a destructive effect upon inflamed and injured tissues.

Anesthesia

General anesthesia is used routinely except in the case of small superficial subcuticular abscesses which can be drained without anesthesia. Most incisions on the hand require careful step-by-step technique and this can be best accomplished with the patient in general anesthesia. Ethylchloride spray as an anesthetic agent should be discarded. It freezes the tissue and lowers the local resistance to infection. The freezing of the tissue and the momentary anesthesia do not allow for adequate, careful incision or identification of important structures. Local injection of an anesthetic agent also causes trauma, and injection into inflamed tissues may easily carry infection into uninvolved areas. For general anesthesia, the author usually uses sodium pentothal intravenously, supplemented by light inhalation anesthesia.

Hemostasis

A bloodless field is indispensable in operations upon the hand. With complete hemostasis, accurate incision and adequate drainage of the abscess can be performed, and at the same time important structures may be clearly visualized, readily identified, and protected from injury. A bloodless field is obtained by applying a pneumatic blood pressure cuff to the upper arm without constriction. The entire cuff is then smoothly wrapped in place with 3-inch wide gauze bandage to prevent escape of any part of the rubber bag from beneath the bandage as the cuff is inflated. Just before operation is begun the arm is elevated for at least one minute, following which the blood pressure apparatus is rapidly inflated to a pressure of 260 mm. of mercury. In children as well as adults, cuff pressure is maintained continuously until incision and drainage of the abscess is completed. The cuff is then deflated and complete hemostasis obtained. The author has encountered no instance of nerve injury when the cuff was used in this manner.

Incisions

The first requirement for an incision of the infected hand is that it be large enough to provide ample drainage. At the same time, it should be such that it will not lead to further disability or induce spread of infection to adjacent spaces.

As a general rule, incisions should lie parallel to skin creases where skin tension is at a minimum.

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Incisions at right angles to skin creases should be avoided as they heal with a thickened contracting scar. An abscess process in a finger is best drained through a midlateral incision, using the ends of the transverse finger creases as guides. Particularly to be avoided are the midline incisions of the fingers and wrist. They lead to scar contracture deformities; and, in the finger, if the tendon sheath is also incised, they may permit prolapse of the flexor tendon. Incision on two sides of a finger or hand are also to be avoided as they may lead to slough and are not necessary for ample drainage.

Instruments

Operations upon the hand are best performed with the aid of a few carefully selected plastic instruments which are particularly adapted to the atraumatic technique required. The number 15 Bard-Parker blade is indispensable. Plastic forceps are most useful in the handling of the delicate anatomical structures of the hand. The largest clamp used for hemostasis is the small mosquito clamp and the small curved-end Providence clamp. Small plastic hook retractors and Senn retractors are very useful. Number 100 cotton is used as ligature material. A large "asepto" syringe filled with saline is used to moisten the exposed tissues at frequent intervals and to irrigate the abscess cavity following incision and drainage.

Drains

The purpose of drains is to prevent agglutination of the wound edges and to aid the escape of infectious exudate.

Following adequate incision and drainage of the abscess, the wound edges are kept apart by lightly inserting fine mesh vaseline gauze at one or both angles of the wound. Firm packing of the wound is avoided as it acts as an impediment to free drainage.

Drains are routinely removed in 24 to 48 hours and should not be replaced. The reinsertion of drains adds infection and delays the healing process. If the incision is not of adequate length or is not properly placed the reinsertion of drains will not compensate for these surgical errors.

The through-and-through drain has no place in operations upon the hand. Its use causes hemorrhage and spreads infection throughout the hand. It is one of the important causes of osteomyelitis of the metacarpals. In the finger, the through-and-through drain may cause injury to the neurovascular bundles and may lead to necrosis of the flexor tendon sheaths and tendons.

Persistent drainage from the wound often indicates the presence of a foreign body or devitalized tissue such as nail, tendon, or bone. Drainage will continue until these are removed. A drain itself is a foreign body and delay in its removal is often the cause of persistent drainage.

After-Care

In the after-care of the infected hand the aim is to provide moist heat, rest and elevation.

Immediately following incision and drainage of the abscess, a voluminous fluffed gauze dressing is applied. This dressing is devised to provide continuous moist heat, immobilization and rest under aseptic conditions. In applying this dressing, sterile gauze is placed between all fingers to keep them separated and to prevent maceration. The hand and arm are then covered with fluffed gauze and put at rest in a functional position on a sterile aluminum splint. The entire dressing, including the splint, is then incorporated in a folded sterile towel. This towel is folded so as to leave several small apertures through which fluid can be added to the dressing. To provide continuous moist heat, an electric baker is placed over the dressing and 10 to 20 drops of sterile saline solution are inserted into the gauze dressing every two hours. At no time should the towel be allowed to become wet. The wound is dressed at 24-hour intervals with strict aseptic precautions. To prevent secondary infection from the nose and mouth a surgical mask is worn by the surgeon during the care of all open wounds.

Usually after two to four days the acute process has subsided and these dressings can be supplanted by warm sterile soap-and-water soaks once or twice daily for 20 minutes. To prevent maceration, the hand is covered with a sterile towel after each soak and allowed to dry under the electric baker.

Sterilization of the wound can be hastened by periodic debridement of crusts and necrotic tissue and, if necessary, by periodic irrigation of the wound with sterile saline or Dakin's solution. Antiseptic solutions and antiseptic ointments are not used during the after-care of the wound, as they cause irritation and interfere with cleanly postoperative care. Hot compresses are not applied to an open wound, as they may frequently be a source of secondary infection.

The importance of elevation as an aid in the healing of inflamed and injured tissues is well known. Elevation of the extremity improves circulation and lessens the edema and congestion which frequently attend infections of the hand. Upon the patient's return to the ward, the author routinely elevates the infected part above the heart level by means of two pillows which are placed on an adjustable bedside stand.

Preservation and Restoration of Function

The position of the hand during the treatment of the acute phase is of the greatest importance. It should be immobilized in what has been termed "the position of function."[7] In this position, the hand would appear to be grasping an object the size of a large orange. The forearm is placed in a position midway between pronation and supination. The wrist is dorsiflexed about 45 degrees. The fingers are slightly separated, and the joints of the fingers flexed about 30 degrees. The thumb is abducted from the hand and rotated so that its flexor surface faces the volar surface of the fingers. If ankylosis or limited motion is to occur in the joints of the fingers or hand, fixation in this functional position

would be preferable to the flat or claw hand which might otherwise result.

Splinting[9] plays an essential part in the treatment of all infections of the hand, and its importance cannot be overemphasized. Properly fashioned splints are indispensable in helping to maintain the hand in the position of function. Splints also provide immobilization and rest which are so necessary for the proper healing of inflamed tissues. Splints are readily fashioned from thin aluminum sheets with a pair of tin snips to meet the requirements of the individual case. The aluminum "universal hand splint" recently devised by Allen and Mason[1] is well adapted to the treatment of the more serious hand infections and deserves special mention. This splint is called the "universal hand splint" because it may be used for either the right or left hand and for a wide variety of conditions. It is excellent for maintaining the hand at rest in a position of function and is particularly adapted to the application of voluminous fluffed gauze and pressure dressings.

As soon as the acute infectious process has subsided, purposeful active motion must be started. This is best performed while the hand is in the sterile hand soak. Active motion started early will not only help to restore function but, by preventing joint stiffness, may save the patient many weeks of physiotherapy.

If residual stiffness persists, active and passive exercises, preferably in a warm soap-and-water soak, supplemented by massage, are beneficial. In those cases which have been neglected or in which pronounced fibrosis and stiffness persist, physiotherapy and tension splinting may be required. It should be stressed that forceful manipulation of the stiffened and fibrosed hand with the patient anesthetized is harmful and is to be condemned. In some cases, specialized operative procedures, such as skin grafting, amputations, nerve and tendon operations, capsulotomy and arthroplasties, may prove beneficial.

INCISIONS FOR SPECIFIC TYPES OF INFECTIONS

Many types of incisions[2,3,4,7,13,16,17,20,27,28,29] have been advocated for drainage of localized infections of the hand. There are certain incisions which the author has found to be practical and effective in the treatment of the more commonly encountered infections. These incisions conform to fundamental surgical principles and will be discussed as they apply to the following hand infections:

Felon

A felon is an acute surgical emergency and immediate incision to prevent osteomyelitis is mandatory. A felon is adequately drained by a mid-lateral hockey-stick incision along one side of the distal phalanx (see Figure 1). The scalpel is swept across the distal phalanx parallel to the surface of the bone and about halfway between it and the skin. The space is widely opened by transecting all vertical septa. Care must be taken in dissecting to avoid injuring the neurovascular bundles and to avoid opening the sheath of the flexor tendon which inserts at the base of the distal phalanx. The bilateral incision in the treatment of felon is not necessary for adequate drainage and often leads to slough. The fishmouth incision should be avoided, as it frequently results in a painful deformity of the fingertip.

Figure 1.—Incision for felon.

Figure 2.—Incision for paronychia.

Osteomyelitis

Osteomyelitis is a frequent complication of the infected hand and commonly occurs in felon. Koch[11] pointed out that osteomyelitis is best treated by providing adequate incision and drainage of the overlying soft tissues. Should necrotic bone separate, it will be extruded, or can be lifted gently out of the wound. Radical operation upon the bone with curette and chisel results in an unnecessary sacrifice of bone and an extension of the osteomylitic process into uninvolved bone.

Paronychia

If observed early, before definite abscess formation occurs, paronychia can usually be aborted by hot soap-and-water soaks, a protective dressing, penicillin given parenterally, and deep x-ray therapy. Splinting of the finger is essential. If abscess formation is superficial, as it is in most cases, it can be drained by merely pushing the eponychium laterally from the nail until an adequate opening in

the abscess cavity is obtained. In severe cases in which the abscess process has separated the nail from the nail bed, adequate drainage of the subungual abscess may be obtained by complete removal of the proximal one-third of the nail. Unilateral or bilateral parallel incisions one-half inch long extending from the base of the nail may be required (see Figure 2). The flap thus formed is elevated and the nail removed, with care taken to remove all nail fragments. A layer of vaseline gauze is laid under the flap for 24 hours and the finger dressed and splinted.

Persistence of a chronic granulating mass following acute paronychia is usually due to a retained segment of devitalized nail which must be removed for cure. Cauterization of this granulating mass causes necrosis of tissue and accomplishes nothing in helping to remove the devitalized segment of nail. If the infection is intractable, trichophytosis, moniliasis or syphilis should be suspected.

Subungual Abscess

In this condition, pus is localized beneath the nail and frequently is situated under the distal portion. Such an abscess is drained by excising a "V" wedge of nail over the site of the abscess (see Figure 3). This can usually be performed without anesthesia.

Figure 3.—Subungual abscess.

Figure 4.—Incision for furuncle and carbuncle.

Furuncle and Carbuncle

A small hair follicle infection, if observed early and not traumatized, will usually subside with conservative treatment. Here again, splinting is essential. The small furuncle can usually be adequately drained by a single transverse incision (see Figure 4). Carbuncles and larger furuncles may be drained by cruciate incisions. In the case of the carbuncle, the incision should extend beyond the apparent border of the infectious process. The flaps are then debrided of all necrotic tissue. The abscess cavity is irrigated and packed open.

Subepithelial Abscess

A subepithelial abscess is a superficial accumulation of pus between the epidermis and dermis. If uncomplicated by deep extension, the abscess can be drained by trimming away the overlying epidermis, usually without anesthesia. At times such an abscess may perforate the dermis and extend into the subcutaneous tissues. The dermis should always be carefully examined for any opening suggesting deep extension of the abscess into the subcutaneous tissue. For drainage of the deeper abscess, adequate incision of the dermis is required.

Subcutaneous and Subfascial Infections of the Finger

Subcutaneous and subfascial infections of the finger can be adequately drained by a midlateral incision on one side of the finger (see Figure 5). This incision should be extended for the full length of the abscess process. Care must be taken not to injure the neurovascular bundle and to avoid opening an uninvolved tendon sheath. Bilateral incisions are not necessary for adequate drainage.

Collar-Button Abscess and Web Space Abscess

In collar-button abscess a subcutaneous abscess of the palm extends under the deep palmar fascia into the deeper tissues and web spaces. The abscess may point dorsally in the webs and dorsal subcutaneous space and may involve lumbrical spaces. A transverse incision in the palm parallel to the distal palmar crease provides excellent drainage for this type

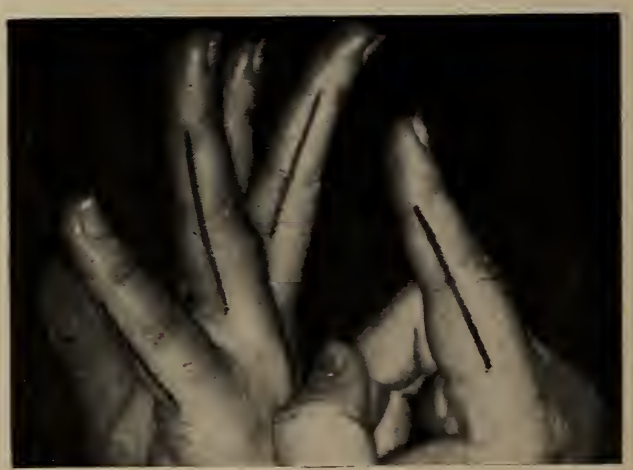

Figure 5.—Incision for subcutaneous and subfascial infections.

Figure 6.—Incision for collar button and web space abscess.

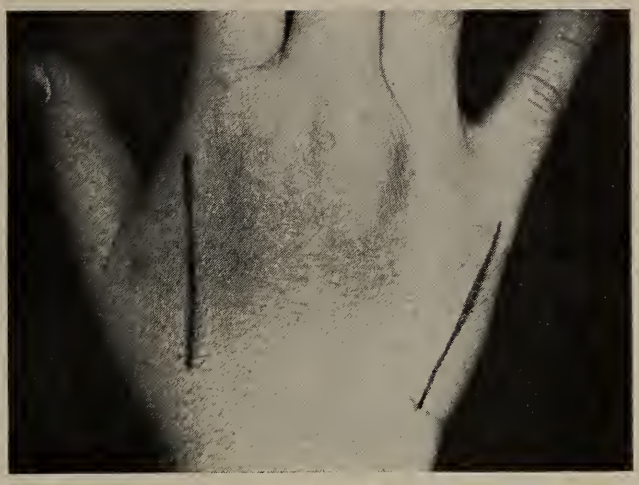

Figure 8.—Optional incisions for subaponeurotic abscess.

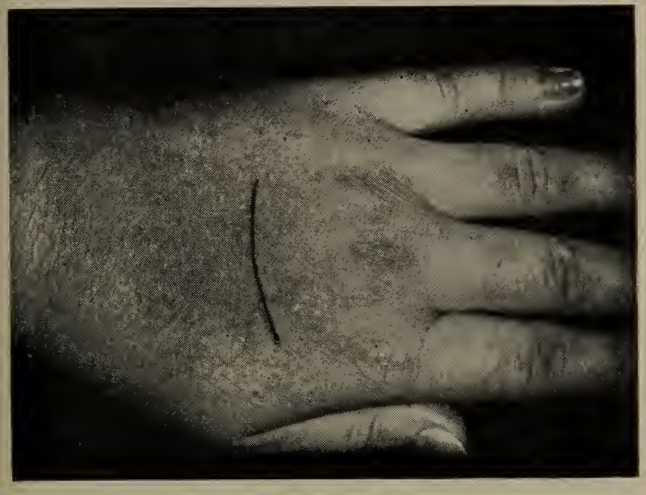

Figure 7.—Incision for dorsal subcutaneous abscess.

Figure 9.—Incision for tenosynovitis.

of subcutaneous abscess and its deep extension (see Figure 6). Rarely is it necessary to drain the deeper abscess process by supplemental dorsal incisions. Vertical incisions which divide the webs are to be avoided, as they heal slowly and leave web deformities and contractures.

Dorsal Subcutaneous Abscess and Dorsal Subaponeurotic Space Abscess

A dorsal subcutaneous abscess can be satisfactorily drained by a transverse incision directly over the abscess and parallel to the dorsal hand skin creases (see Figure 7).

The dorsal subaponeurotic space abscess which lies deep to the extensor tendons can be adequately drained by a radial or ulnar lateral incision on the dorsum of the hand or by a long transverse incision on the dorsum of the hand (see Figure 8).

Tenosynovitis

Acute tenosynovitis of the suppurative and nonspecific type is a surgical emergency and demands immediate drainage. Operation is contraindicated only in those cases which are complicated by a rapidly spreading infection.

Drainage of the infected tendon sheath in a finger can be obtained by a midlateral incision extending from the distal interphalangeal joint crease to the base of the finger (see Figure 9). The neurovascular bundle must be identified and retracted dorsally. After the tendon sheath has been exposed, it is fully incised along its lateral aspect. When the sheath is incised well laterally, the tendon does not prolapse forward, and it is not necessary to preserve segments of the sheath as annular ligaments.

Rarely is tenosynovitis confined to the digital sheath or a part of the digital sheath. In most cases the proximal cul-de-sacs of the flexor tendon sheaths of the index, middle, and ring fingers are also involved and these can be drained by a 1-inch transverse incision in the palm distal to and parallel to the distal palmar crease (see Figure 9).

Ulnar Bursa Infection

Drainage of the flexor tendon sheath of the little finger and the ulnar bursa requires three separate incisions (see Figure 10). The flexor tendon sheath in the little finger is drained by an ulnar midlateral incision. The ulnar bursa in the palm is drained by an incision which begins at the distal palmar crease and follows the radial border of the hypothenar muscles to the base of the hand. The proximal extension of the ulnar bursa is drained by a three-inch incision on the ulnar aspect of the forearm and wrist.

This incision is placed in the groove between the flexor carpi ulnaris tendon and the ulna. The ulnar nerve and vessels are retracted forward with the tendons, and dissection is carried into the retroflexor space along the pronator quadratus muscle. The distended ulnar bursa can then be visualized and drained.

In draining the ulnar bursa it is usually not necessary to transect the transverse carpal ligament. However, if decompression must be provided, the transverse carpal ligament can be transected well laterally without ill effects.

It should be emphasized that when both the radial and ulnar bursae are involved, as usually occurs, both can be adequately drained through the ulnar forearm incision.

Radial Bursa Infection

The flexor tendon sheath of the thumb and the radial bursa are drained by two incisions. The first, a midlateral incision, is placed along the ulnar side of the thumb and is extended proximally over the thenar eminence to within one inch of the transverse carpal ligament (see Figure 11). Here it is discontinued to avoid injury to the motor branches of the median nerve which innervate the thenar muscles. The radial bursa in the wrist can be drained by a three-inch incision on the radial side of the wrist and distal forearm (see Figure 11). This incision is made just anterior to the radius and is comparable to that used for drainage of the ulnar bursa.

The radial and ulnar bursae are potentially or actually communicating in practically all cases. When one of these spaces becomes infected, the other is soon involved. At times one space is involved and the other space is only questionably so. In such cases, it is preferable to explore the questionably involved space first. If the bursa is not involved, little harm will be done. However, if an uninvolved space is explored after an infected space is drained, it could hardly escape infection.

Midpalmar Space Abscess

A transverse incision in the palm along or parallel to the distal palmar crease gives ready access to the midpalmar space[6] and to the associated lumbrical canals (see Figure 12). This incision should not be developed more radial than the middle finger metacarpal bone if opening the thenar space is to be avoided.[6] The use of general anesthesia and complete hemostasis are indispensable in draining this space, as the incision in the skin and deep palmar fascia lies at right angles to the course of the underlying nerves, vessels, and tendons.

Figure 10.—Incisions for ulnar bursa.

Figure 12.—Incision for midpalmar space abscess.

Figure 11.—Incisions for radial bursa infections.

Figure 13.—Incision for thenar space abscess.

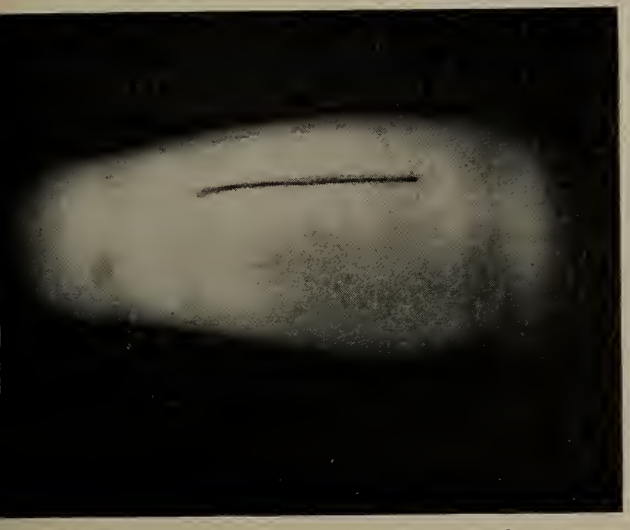

Figure 14.—Incision for proximal forearm abscess.

Thenar Space Abscess

The thenar space[6] is approached from the dorsum of the hand. This space is adequately drained through a 1½-inch incision developed along the radial border of the first dorsal interosseous muscle (see Figure 13). The incision almost parallels the dorsal margin of the web between the thumb and forefinger and is carried through the skin and subcutaneous tissue. Dissection is then developed along the palmar surface of the adductor pollicis muscle into the thenar space. After evacuation of the abscess, drainage is assisted by the insertion of a fine-mesh vaseline gauze pack to keep the wound edges apart.

Deep Abscess of the Forearm

Abscess of the retroflexor space usually arises as a result of rupture of an infected radial or ulnar bursa. An abscess of the retroflexor space may be drained through a three-inch incision on the ulnar forearm identical to that used in draining the ulnar bursa (see Figure 10).

Infection from the retroflexor space may extend up the arm along the course of the median and ulnar nerves and the ulnar artery into a more superficial position between the flexor digitorum sublimis and profundus muscles. Deep abscess of the proximal forearm is drained by a longitudinal incision on the ulnar aspect of the forearm. This incision, at least three inches in length, is placed over the junction of the upper and middle thirds of the forearm and is developed between the flexor carpi ulnaris and flexor digitorum sublimis muscles (see Figure 14). This approach allows ready access to the abscess cavity and provides for ample drainage.

GENERAL MEASURES AND SPECIFIC TREATMENT

General Measures

Ordinarily, a patient with acute infection of the hand is sick. In cases in which there are general symptoms due to sepsis, or in which these symptoms are anticipated, general care of the patient should be instituted promptly. During the acute stage of the infection, the patient should be put to bed and kept warm in surroundings which are quiet and restful. The diet should be of the high caloric type and may be supplemented by vitamins, proteins, and iron as indicated. The fluid intake should be sufficient to produce 1,000 to 1,500 cc. of urine output daily. Sedatives and analgesics are used for relief of restlessness and pain, but in amounts which will not mask symptoms due to extension of the infection. Hyperpyrexia is combated by alcohol rubs and tepid sponge baths.

Specific Measures

The antibiotics[25, 26] are frequently used in the treatment of acute infections of the hand and are particularly effective in the control of rapidly spreading infections. Penicillin[2, 5, 16, 17, 24] remains the antibiotic of choice except in those cases in which bacteriological analysis reveals the presence of organisms which are resistant or antagonistic to penicillin. The remaining antibiotics and chemotherapeutic agents, although used less frequently, have their specific indications and are usually used as an alternative to or in combination with penicillin. The antibiotics are generally administered parenterally but at times are used topically with very gratifying results. The sulfonamides are not recommended for local use because of their tendency to cause irritation and adhesions and because of their tendency to aggregate and behave as foreign bodies.

Zinc peroxide, if used exactly as described by Meleney (cited by Requarth[28]), is of value in the treatment of microaerophilic hemolytic streptococcal infections as well as in other types of anaerobic infections such as human bite infection and gas gangrene. However, since the advent of the antibiotics, the author has found fewer indications for the use of zinc peroxide.

The author's use of vaccines and sera[3] in the treatment of acute nonspecific infections of the hand is limited to tetanus antitoxin and polyvalent antigas bacillus serum.

Whole blood transfusions,[4, 29] preferably given in 250 cc. amounts every second or third day, are invaluable in the treatment of a patient critically ill

with an acute infection of the hand. Immunotransfusions have limited applicability, but are of value in selected cases.

Deep x-ray therapy has also proved to be of benefit in certain cases of acute infections of the hand. It is particularly helpful in aborting and localizing infections such as paronychia, furuncle, and carbuncle. It is worthy of trial in the treatment of uncontrolled gas bacillus infections and has proved to be effective in the treatment of osteomyelitis of the bones of the hand.

The author has had no experience with the injection of penicillin solution locally into abscesses and inflamed tissues. This method is reportedly painful and opens up new avenues to the spread of infection. Injecting into inflamed tissues does not conform to fundamental surgical principles and is not recommended.

Glowing reports[2, 5, 16, 17] have recently appeared, originating particularly in England, advocating a new method of treatment of localized abscesses of the hand. This treatment consists of excision and immediate primary closure combined with immobilization and penicillin therapy, both local and parenteral. The supporters of this method contend that treatment in this manner not only shortens the period of treatment and disability, but lessens the need for hospitalization and minimizes the extent of disability.

It should be stressed that sufficient time has not yet elapsed, and the number of patients treated by excision and primary closure, immobilization, and penicillin is relatively small. This method is still on trial and final conclusions concerning its efficacy cannot yet be drawn.

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Medical Progress in Cholesterol Metabolism in Relation to Diseases of the Liver and the Biliary Tract

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SUMMARY

In recent years the role of cholesterol in hepatic disease has been somewhat better understood.

Fairly characteristic patterns of serum cholesterol and cholesterol esters occur in obstructive and parenchymatous jaundice.

While the determinations for cholesterol and its esters may aid in the differential diagnosis of jaundice, their chief value appears to be that of determining the prognosis in jaundiced patients.

The role of cholesterol in several diseases of the hepatic and extrahepatic biliary tract is reviewed.

In recent years there has been a better understanding of the role played by cholesterol and its esters in the various diseases characterized by changes in the amounts of these two substances in the blood. The purpose of this report is to review some of the pertinent literature concerning changes in cholesterol metabolism in diseases of the liver and biliary tract. The part which cholesterol plays in diseases of the heart and blood vessels, in thyroid disease, and in lipoid dystrophies will not be considered. The subject of lipid metabolism in general has been very carefully reviewed by Weinhouse[39] and later by Thannhauser.[29, 30]

PHYSIOLOGY

A brief review of some of the fundamentals of cholesterol metabolism may give a better understanding of its importance in various clinical conditions.

Cholesterol is regarded as an essential constituent of protoplasm. It occurs in two forms in the body, as a free form, in which it appears to function as a structural part of the cell membrane, and in the esterified form, in combination with fatty acids. The ester of cholesterol occurs chiefly in the blood plasma and in the adrenal cortex.[19, 24] There is a wide range of normal for the concentration of cholesterol and its esters in the blood plasma. By the usual laboratory techniques the range of normal for total cholesterol is from 140 to 250 mg. per 100 cc. of plasma. About 60 to 80 per cent of that amount is in the form of cholesterol esters. The remainder is free cholesterol.[34] The equilibrium between free and esterified cholesterol is maintained by the enzyme cholesterol esterase, which is widely distributed in the body. The ratio of free to total plasma cholesterol, which is of significance in the diagnosis of liver disease, is in effect a measure of the integrity of this enzyme.[20, 24]

The function of cholesterol itself in body metabolism is not completely understood, although its wide distribution in the animal kingdom is indicative of its necessity. The main function of cholesterol is indicated by the fact that it, and its esters, are present in a constant percentage in every lipoid mixture occurring on the surface or within the cells.[39] The multitude of sex and adrenal hormones with similar sterol ring systems suggests a common precursor. These include the estrogenic sex hormones, progesterone, adrenal cortical hormones, vitamin D, the male sex hormones, the cardiac glucosides and the bile salts.[24]

Animals and humans synthesize cholesterol. This was first proven by Gamble and Blackfan[13] in 1920. They used balance experiments in infants and showed that more cholesterol was excreted than was ingested. These findings have been subsequently verified by other workers.[6, 7, 8, 9, 29, 30, 32, 33, 40]

Experiments with deuterium containing water indicated that the synthesis of cholesterol is through the coupling of a number of small carbon acetate molecules.[3, 6, 16, 28, 36, 37, 38, 41]

Cholesterol of exogenous origin is absorbed from the diet in a varying degree. A cholesterol esterifying enzyme exists in the intestinal tract and is activated by biliary, duodenal and pancreatic secretions. The enzyme is apparently important in the absorption of exogenous cholesterol.[20, 24] Carnivorous and omnivorous animals absorb cholesterol readily, while herbivorous animals absorb it in only limited amounts, and dispose of it with difficulty. It is for this reason that the correlation of experimental data in the different species is difficult to evaluate.

In view of the known synthesis of cholesterol in the body and the fact that animals will thrive on a cholesterol-free diet, it is evident that this substance is not a dietary essential.

Cholesterol, regardless of its origin, may be destroyed in appreciable amounts in the body, and the amount thus metabolized is related to some extent to the quantity in the diet.[8, 9, 16, 29, 30, 32, 33, 40]

Cholesterol is excreted chiefly through the intestinal wall and in the bile. An additional small amount is excreted through the skin in the human being.[24]

THE ROLE OF CHOLESTEROL IN DISEASES OF THE LIVER AND BILIARY TRACT

One of the major causes of changes in the blood levels of cholesterol and cholesterol esters is hepatic and biliary tract disease. It should be pointed out,

however, that other conditions such as hypothyroidism, the nephrotic syndrome and pregnancy, just to mention a few, are characterized by changes in the blood cholesterol levels. Because of this, it is unwise to regard the cholesterol and cholesterol esters content of blood as a test of liver function, per se.[21] Determinations of these two constituents at weekly or bi-weekly intervals, when taken in conjunction with the serum bilirubin levels, offer considerable assistance in the differential diagnosis of various types of liver disease.[26] While determining the relationship of cholesterol esters to total cholesterol is of some value in the differential diagnosis of jaundice, perhaps the chief value of this ratio is as an indicator of the severity of hepatic damage.* For example, it has been pointed out that when jaundiced patients with a cholesterol esters value of 60 mg. or less per 100 cc. are treated surgically, the mortality rate is considerably higher than it is for patients with values above 60 mg. per 100 cc.

In cases of fairly long standing diseases of the liver and extrabiliary tract, there is always some degree of cellular damage superimposed on primary biliary obstruction, and vice versa. Because of this the clinical picture and the laboratory data may be misleading.

*References: 10, 11, 19, 21, 25, 35.

Obstructive Jaundice. In obstructive jaundice, an increase in the total serum cholesterol, as well as in the cholesterol esters, is a fairly constant finding.[10, 11, 19, 26] The reason for the rise of cholesterol in obstructive jaundice has not been satisfactorily explained.

The relationship of hypercholesterolemia to that of hyperbilirubinemia enhances the significance of the former finding in the diagnosis of simple and uncomplicated obstructive jaundice. In such instances, a rough parallel has been demonstrated between the elevated serum bilirubin and elevated serum cholesterol.[10, 11, 26] In instances of obstructive jaundice where the total cholesterol value does not rise significantly, some degree of hepatocellular damage usually exists as a complication. If and when biliary obstruction is overcome, the total serum cholesterol, together with the content of cholesterol esters fractions, decreases.[21] This occurs in a somewhat parallel fashion—in much the same ratio as the parallel of increase during the onset of the obstruction[26] (Figure 1). In some instances the total blood cholesterol values remain higher than normal for several months following relief of the obstruction.[10] Should sufficient cellular disease of the liver exist, however, the total cholesterol and cholesterol esters values in obstructive jaundice will not rise

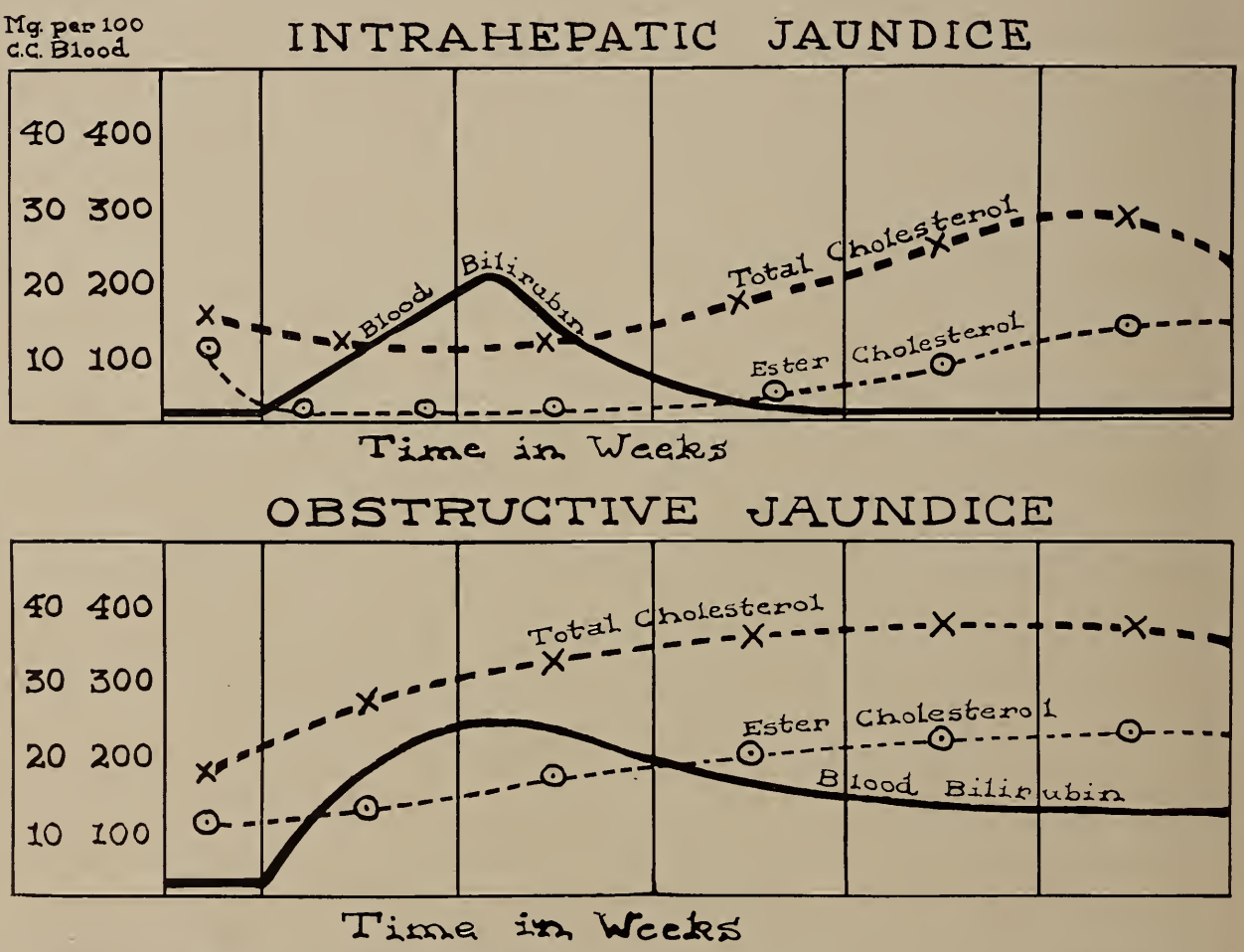

Figure 1.—Values for total cholesterol and cholesterol esters in relation to serum bilirubin at various stages in intrahepatic and obstructive jaundice (Modified from Ottenberg).

proportionately. In such instances the rise in esters fractions tends to lag.[10, 11, 35] In obstructive jaundice, hypercholesterolemia may not develop if the obstruction is incomplete.

TABLE 1.—*Cholesterol Partition in Diseases of the Liver and Biliary Tract (after Thannhauser[30])*

Condition	Total Cholesterol mg./100 cc.	Cholesterol Esters Per Cent Total Cholesterol	Free Cholesterol mg./100 cc.
Normal values	150-260	70-75	40-70
Hepatitis:			
Acute	260-400	40-60	100-260
Chronic	300-400	30-40	210-280
Acute-yellow-atrophy type	Less than 100	10-30	70-80
Complete obstruction of common bile duct by stone or tumor:			
Acute	350-400	60-70	Normal
Chronic	400-500	40-50	200-300
Biliary cirrhosis	260-400	40-60	100-240
Compensated portal cirrhosis	Normal	Normal	Normal
Alcoholic cirrhosis complicated by hepatitis and fatty liver	260-400	40-50	130-240
Xanthomatous biliary cirrhosis	800-2200	Normal	240-640
Liver insufficiency of varied etiology	Less than 100	10-40	10-60

In *primary biliary cirrhosis* (intrahepatic origin) and in *secondary biliary cirrhosis* (extrahepatic origin) the serum cholesterol, particularly free cholesterol, is significantly elevated, sometimes strikingly so. Values as high as 1,400 mg. per 100 cc. have been recorded.† Primary biliary cirrhosis differs from so-called xanthomatous biliary cirrhosis chiefly in a matter of degree.[1] The serum lipid picture in primary and secondary biliary cirrhosis is rather characteristic and quite different from that seen under normal conditions. Whereas in conditions other than biliary obstruction, characterized by hyperlipemia, the cholesterol esters or neutral fat fractions predominate, in the case of biliary cirrhosis the phospholipids and free cholesterol fractions predominate. To further differentiate these two groups, the serum in the case of biliary obstruction remains transparent and clear, whereas in many other hyperlipemic conditions, the serum is milky. The ratio of phospholipids to total lipids appears to be the determining factor as to whether lipemic serum remains clear or becomes milky. Accordingly the high concentration of serum phospholipids which occurs in biliary obstruction is considered responsible for the clarity and transparency of the serum in this condition.[1] In primary biliary cirrhosis, the xanthomatous changes in the skin occur in relation to the degree of elevation of the serum lipids. This includes the free and total cholesterol fractions as well as the ratio between these two substances. A fairly critical level of total serum lipids exists above which skin xanthomatosis occurs. In biliary cirrhosis total lipid values above 1,800 mg. per 100 cc. are uniformly associated with generalized xanthomatosis. Xanthelasma and generalized xanthomatosis have not been observed in persons with total lipid values of 1,300 mg. per 100 cc. or lower.[1] Furthermore, patients in whom serum lipids have fallen spontaneously from above 1,800 mg. per 100 cc. to lower levels have had resolution of the xanthomatous skin lesions.[1, 14] Thus, in biliary cirrhosis, whether in the "pre-xanthomatous" or "xanthomatous" stage, the cholesterol esters fraction, and free cholesterol, along with other lipid components, are strikingly elevated.

Hepatocellular Disease. Parenchymatous liver disease is usually associated with a decreased value for total cholesterol, as well as for the esters fraction.* The esters fraction value may decrease to a much greater degree than does the free cholesterol and in the stage of active necrosis may approach zero.[10, 11] The amount of esterified cholesterol is roughly proportionate to the degree of liver cell damage and as such has considerable prognostic value in various types of parenchymatous disease of the liver. In instances where the total cholesterol and the esters values remain approximately normal, the disease is usually mild and the prognosis good.[21, 25] On the other hand, the outlook is extremely grave if the free and esterified fractions are both depressed to low levels. However, if improvement occurs, the cholesterol esters gradually rise. In hepatocellular disease, as contrasted with that of primary obstructive jaundice (Figure 1), the values for serum cholesterol and serum bilirubin tend to diverge, with the cholesterol falling as the bilirubin rises.[17, 26]

In *atrophic cirrhosis of the liver* (Laennec's cirrhosis) the serum cholesterol value varies with the stage of the disease at the time of the investigation.[29, 30] In general, the total serum cholesterol and the cholesterol esters remain normal, unless there is superimposed an acute hepatic degeneration, or terminal cholemia develops. In these instances, the blood cholesterol partitions resemble those typical of primary liver degeneration.

In *acute yellow atrophy* the total cholesterol value as well as that of cholesterol esters is decreased even to the point where ordinary methods of testing do not show the presence of cholesterol esters. Thus a steadily dropping cholesterol esters value in the blood of a jaundiced patient, particularly if it approaches the zero level, indicates a serious and oftentimes fatal outcome, even though the patient's general condition at the time might otherwise appear to be satisfactory.

In the majority of cases of *infectious hepatitis* the total cholesterol value ranges between 300 and 400 mg. per 100 cc. while the cholesterol esters fall to 30 to 60 per cent of the total. In certain other

†References: 1, 5, 12, 14, 15, 17, 18, 22, 23, 29, 30, 31, 32, 33.

*References: 10, 11, 25, 26, 29, 30, 32, 33.

types of acute hepatic degeneration the total cholesterol value has been found to be above 300 mg. per 100 cc. in only 12 per cent of cases.[10, 11, 25] However, the failure to conform to the usual pattern of hyperbilirubinemia with increased values for total cholesterol and decreased values for esters does not necessarily rule out the possibility of infectious hepatitis. The most likely explanation for the lack of typical changes is the mild nature of the disease or the degree of recovery at the time of the examination.

Two exceptions occur to the general rule that the total cholesterol and esters fraction are decreased in parenchymatous liver disease.[21] In toxic hepatitis, produced by such agents as arsphenamine, hypercholesterolemia may be noted from the onset of the jaundice. Likewise, in the so-called "regenerative phase" of intrahepatic jaundice, increased values for serum cholesterol occur. While it may be possible to explain this increase on the basis of pericholangiolitis in the case of toxic hepatitis, a satisfactory explanation has not been found in the case of "regenerative" hepatocellular disease. The hypercholesterolemia of acute and chronic alcoholism appears to be related to a disturbance of fat metabolism. (It is noteworthy in this regard that the liver of many alcoholics is fatty.)

Gallstone formation. Pure cholesterol stones occur as the result of disturbance of the cholesterol metabolism and usually develop singly in the gallbladder. Stone formation results from the decrease in the ratio of bile salts to cholesterol in the bile. In ordinary circumstances, cholesterol is dissolved in the bile through the influence of bile salts. This is probably by the formation of loose compounds. The best bile salt solvent for cholesterol seems to be desoxycholic acid. It probably plays the most important part in keeping cholesterol in solution.[2]

In ordinary circumstances the gallbladder wall does not absorb or excrete either bile salts or cholesterol. The absorption of fluids which ordinarily occurs in the gallbladder is unaccompanied by any change in the ratio of bile salts to cholesterol. The ratio of either of these two substances to the total solids of the bile likewise is unchanged.

When the gallbladder is injured or inflamed, the wall becomes permeable to bile salts. This results in a significant decrease in the ratio of bile salts to cholesterol, and as a result cholesterol crystals precipitate in the bile.

Pure cholesterol stones may develop in the absence of infection, but with stasis, in persons with altered cholesterol metabolism. The gallbladder, in such cases, may show no pathologic change; it may be able to concentrate dye satisfactorily in a high percentage of cases before the complications of obstruction arise.

Mixed stones containing cholesterol are assumed to have started as pure cholesterol stones in the gallbladder. Then one of the stones obstructs the cystic duct, following which calcium salts, pigment and more cholesterol are deposited in layers on the stones remaining in the gallbladder, and to a lesser degree, on the obstructing stone in the cystic duct.[27]

Stones in the common duct are usually preceded by stone formation in the gallbladder, with the calculi then passing from the gallbladder to the common duct. It is unusual for common duct stones to develop independently of gallbladder stones, although this may occur in cirrhosis of the liver and in obstruction of the common duct due to carcinoma. Common duct stones are rich in cholesterol, having originated, as a rule, in the gallbladder and having then developed into mixed calculi by a process similar to that for development of the gallbladder stones. The source of cholesterol for the formation of new cholesterol stones in the common duct following cholecystectomy is assumed to be the bile.

In cholecystitis, with cholelithiasis, but with no obstruction of the outflow of the bile and with no complicating infections of the biliary passages, there is usually no change in the value for serum cholesterol.

During pregnancy hypercholesterolemia develops as a rule. The reason for this is not clear. Suffice it to say, the cholesterol load at such times is heavy, and it seems likely that this is liable to lead to the development of calculi in the biliary system. This may account in part for the high incidence of cholelithiasis among women who have borne children.

Although the present methods of treatment of gallbladder and common duct stones is logically surgical, the ideal treatment would be prophylaxis, based upon dietary management, particularly for patients with a personal or familial history of gallstones, for obese persons, for pregnant patients and for patients with hypercholesterolemia of unknown origin.

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Citrate Tolerance

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SUMMARY

There is a wide variation among human beings in tolerance to sodium citrate. It is important to those concerned with blood transfusions that the incidence of reactions to citrate is quite low, except in the event of massive transfusing, when the amount of citrate with the blood being given to the patient must be carefully considered.

CIRCULATION is practically unaffected by citrates as used clinically. Larger doses, 30 mg. of sodium citrate per kg. of body weight, depress heart muscle and stimulate the vasomotor center in dogs. Renal vessels may be dilated. The cardiac vagus is completely paralyzed by intravenous injection of sodium citrate in cats and turtles. It is apparently due to lowering of the calcium ion concentration and may be prevented by the injection of calcium chloride. Spontaneous recovery is complete in 20 to 30 minutes in cats.[18]

Strong solutions of citrate depress all portions of rabbit intestines. When injected intravenously into dogs, small doses of sodium citrate stimulate gastric and intestinal movements feebly. Larger doses, 100 mg. per kg. of body weight, injected rapidly, cause a temporary depression of the stomach and intestine. Excised uterus of guinea pigs responds with pronounced increase in tone with weak concentrations and decreased tone with strong concentrations.[18]

In normal individuals, the change of acid-base balance after ingestion of 6 to 8 gm. of sodium citrate is neither prolonged nor pronounced. After 20 gm., the change is maximal in one and a half to two hours. With oral administration of sodium citrate in the amount of 0.2 gm. to 2 gm. per kg. of body weight, the rise of citrate concentration in the blood lasted three and a half to seven and a half hours. An average of 0.7 per cent of the amount given escaped oxidation and was excreted in the urine. When injected intravenously, citrate disappears rapidly from the circulation. Human and dog urine, blood, and other body fluids constantly contain small amounts of citrates, which are probably synthesized as well as oxidized in normal metabolism. The normal human urinary excretion is about 0.5 gm. daily; the level in blood serum is about 2.5 mg. per 100 cc., with a range of 1.5 to 5 mg. in pathological conditions, the highest values in hepatitis.[18]

The actions of sodium citrate correspond to those of calcium deprivation. The inactivation of calcium by citrates prevents the clotting of milk. Citrates, like other calcium inactivators, render the blood noncoagulable in vitro. The addition of 0.2 per cent of citrate to shed blood prevents coagulation completely, even for 48 hours, while 0.1 per cent does not hinder coagulation at all. One per cent of citrate keeps the blood noncoagulable for two weeks, but shrinks the corpuscles. Intravenous injection of sodium citrate has the opposite effect; it shortens the coagulation time. This effect occurs in human subjects with 10 to 50 cc. of 10 per cent citrate; the blood returns to normal within 24 hours. The mechanism has not been explained, but it has been attributed to injury of the platelets, leading to the liberation of thromboplastin.[18] Citrates form double salts with calcium which do not liberate calcium ions. In the process of coagulation, four factors are essential: Prothrombin, thromboplastin, calcium, and fibrinogen. In the coagulation mechanism thromboplastin, in the presence of ionized calcium, converts prothrombin to thrombin. By fixing the ionized calcium with sodium citrate, the conversion of prothrombin to thrombin is prevented.[10]

USE OF CITRATES IN TRANSFUSIONS

Probably one of the most important advances in the technical development of blood transfusion was made by Hustin, of Belgium, in 1914, when he reported experiments on the use of sodium citrate and glucose in the prevention of the coagulation of blood. In the same year, Agote, of Buenos Aires, performed the first transfusion in which citrate alone was used as an anticoagulant. In the following year, in this country, Lewisohn and Weil independently perfected the technique and standardized the dosage of citrate.[11]

When blood or plasma is to be used for transfusions, it is desirable to dilute it as little as possible; but coagulation must be prevented. This is accomplished by the use of solutions containing sodium citrate. In the preparation of plasma, usually about 500 cc. of blood is collected in a bottle containing 50 cc. of a 4 per cent solution of this salt. The mixture is kept cold until the cells are centrifuged down or allowed to settle, and the plasma is then drawn off. Citrate alone is not adequate for the preservation of whole blood for very many days, as the cells undergo hemolysis even in an isotonic solution. It was found by Rous and Turner in 1916 that this hemolysis could be greatly delayed by the addition

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of a considerable amount of an isotonic solution of glucose. Although citrate solutions are alkaline, the pH of the blood in the mixture is not far from the normal value of 7.4. It has been reported, however, that cells are better preserved in a slightly acid medium. Citric acid-sodium citrate-glucose mixture has a pH of about 4.9, which is raised to 6.5 or more by the addition of blood.[8]

At the Mayo Clinic the transfusion of whole citrated blood or plasma is directly under the supervision of the section of anesthesia where whole citrated blood is collected into suitable containers in which there is 75 cc. of 2.5 per cent solution of sodium citrate for each 500 cc. of blood to be withdrawn from the donor. If the blood is to be used immediately, it is not placed in the refrigerator. However, if the citrated blood is to be stored, the bottle is suitably sealed and kept in a refrigerator at 10°C. Although the chill is usually taken off refrigerated blood before administration, this is not absolutely necessary. There are special preservative agents that may be used to delay hemolysis, thus allowing the storage of blood for 30 days or more. It has been shown, however, that there is minimal hemolysis for the first five days when the blood is mixed with sodium citrate. Seventy-five cc. of 2.5 per cent solution of sodium citrate usually is adequate to prevent the coagulation of 500 cc. of blood. Gentle agitation during collection of the blood and vigorous shaking of the sealed bottle will mix the blood and the sodium citrate thoroughly, and will prevent the formation of even small clots.[17]

REACTIONS FOLLOWING TRANSFUSIONS OF CITRATED BLOOD

A number of investigators have contended that reactions of a mild nature—that is, chills and fever—occur more frequently following the transfusion of citrated blood than of unmodified blood.[11, 12] Beck, for instance, in an extensive analysis of approximately 17,000 transfusions, found that the average incidence of reactions following citrate transfusions was approximately 30 per cent, in contrast to an incidence of 11 per cent with unmodified blood.[4]

Citrated blood transfusions are sometimes followed by a fairly severe chill and temperature of about 100° F. in half an hour or so, with return to normal in four to eight hours. This reaction has little practical importance, and is apparently due to alterations produced in the corpuscles.[18] The fully developed reaction is characterized by generalized tingling sensations, apprehension, dilation of the pupils, carpopedal spasm, and tetany. Chvostek's sign is positive and there is general rigidity. Cyanosis was observed in three reactions by Hill and Muirhead,[7] and there was transient apnea in a newborn infant. Many of these signs are masked, of course, by general anesthesia, but, according to Adams, Thornton, Allen and Gonzales[1] in experimental bleeding and citrated whole blood administration to dogs, alterations in blood pressure are frequently observed for several minutes prior to a rapid terminal fall; respiratory failure was never observed prior to cardiac failure; muscular reactions were variable; eye reflexes usually became sluggish before disappearing completely; the color of the blood became very dark; severe acidosis was observed, the pH falling from an original 7.4 down to as low as 7.15. Deaths ascribed to the use of citrate in transfused blood have been reported.[3, 5]

Frequently it is difficult to determine whether a transfusion is the cause of an untoward reaction or whether this untoward reaction is a consequence of the patient's illness or the surgical operation. According to some investigators the causes of reactions in citrated blood transfusions are explained variously: (1) prolonged exposure of blood to foreign substances that the citrate method entails;[15] (2) delayed, careless and insufficient citrating;[5] (3) deleterious effects of citrates on blood platelets;[6] (4) increased friability of red blood cells by citrate;[6] and (5) certain chemical changes in the blood produced by citrate, such as incipient coagulative changes.[16] The Anesthesia Section of the Mayo Clinic outlined briefly a few of the more commonly observed reactions:[17]

1. Reactions due to defects of technique characterized by the development of chills and a rise in temperature which may occur within a few minutes after the completion of the transfusion or may be delayed for an hour or two. This is ascribed to the citrate method of transfusion because of poorly distilled water and improperly cleansed apparatus used in the performance of the withdrawal, storage and administration of blood. Lewisohn and Rosenthal[13] emphasized the necessity for a centralized department for the thorough cleansing and preparation of transfusion apparatus and recommended that only sodium citrate which has been prepared with triple distilled water obtained from a special Barnstead still be used. For actual use, 1 cc. of a 30 per cent solution of sodium citrate, so prepared, is used for every 100 cc. of blood. After each transfusion, all parts are separated and washed in cold water for the removal of blood. They are then washed in a dilute solution of green soap to which a 1 per cent compound solution of cresol has been added. They are then thoroughly rinsed in tap water before being boiled for five minutes in 0.1 per cent solution of sodium hydroxide. They are then rinsed in triple distilled water and are ready to be assembled and sterilized, either in metal boxes or in special bundles in the autoclave.

2. Hemolytic reactions which may be due to incompatibility, minor hemagglutinins and certain pathologic conditions. The reaction following the administration of incompatible blood usually makes its appearance very early during the administration of the blood. Severe pain in the back and chest. dyspnea, cyanosis, sweating, and shock are some of the manifestations. Hemoglobinuria usually appears; jaundice may occur, but anuria does not follow necessarily.

3. Allergic and anaphylactic reactions are characterized by urticaria, angioneurotic edema, dyspnea, asthmatic rales, involuntary movement of the bowels, and excretion of urine.

4. Syphilis, malaria, influenza, measles, smallpox, and septicemia have been reported as being transmitted by the transfusion of blood.

TOXICITY OF SODIUM CITRATE

Considerable variation of opinion exists regarding the rate of administration of blood. Some investigators believe that blood should be given slowly, whereas others are of the opinion that this has been overemphasized. On the basis of the experience of Kilduffe and DeBakey in over 5,000 transfusions of unmodified blood, it may be stated that an average adult transfusion of 500 cc. may be given safely at the rate of 1 cc. per second. In urgent cases, as in peripheral circulatory failure, blood may be given at an even faster rate. As much as 600 cc. of blood has been given frequently in such cases, in less than five minutes. On the other hand, in patients with definite myocardial disease or patients with pronounced secondary anemia in which there has been probable myocardial damage from the chronic anemia, considerable care must be exercised in administering the blood. In the average citrate transfusion of 500 cc. for patients with no cardiorespiratory disturbance the rate of flow generally recommended is about 40 to 50 drops per minute or about 150 cc. per hour.

Ivy and associates,[9] on the basis of experimental work on dogs, concluded that 1,500 to 2,500 cc. of citrated blood or plasma given rapidly to a man weighing 70 kg. might prove fatally toxic. Thornton and co-workers[19] in experiments on dogs obtained results similar to those of Ivy, but they found that dogs, bled of as much as 60 per cent of their estimated blood volume, survived if the replacement by citrated whole blood was made over a period of 20 minutes or longer. They felt it unlikely that any of the reactions observed in laboratory experiments would occur in man, and that one should not hesitate to give massive transfusions when indicated. Allen, Clark, Thornton, and Adams[2] studied 53 patients who received 1,500 cc. of citrated whole blood at the time of various radical operations. They concluded that the loss of blood at such major procedures generally exceeds that estimated at the time of operation. Nine of the patients studied received 20 gm. of citrate without incident, and the transfusion periods ranged from two to six hours. Luria[14] reported a case of ruptured abdominal pregnancy in a 52-kg. woman who received 7,500 cc. of citrated whole blood without reaction. This amount of blood contained 24.75 gm. of sodium citrate and 9 gm. of citric acid.

A man, aged 52 years and weighing approximately 154 pounds, was admitted to the San Diego County General Hospital for portacaval anastomosis as a treatment for portal hypertension. At operation the patient received a total of 45 pints of whole blood, containing 74 gm. of sodium citrate, in less than seven and a half hours. During the first six hours of operation, the patient received blood at the rate of 500 cc. per hour and citrate at the rate of 0.023 gm. per kg. of body weight per hour; and during the last one and a half hours blood was given at the rate of 13,000 cc. per hour and citrate at the rate of 0.61 gm. per kg. of body weight per hour. The average was 6,750 cc. of blood per hour and 0.317 gm. of citrate per kg. per hour. Death was not considered entirely attributable to citrate intoxication. It is interesting to note the extremely wide individual variation in tolerance to sodium citrate among humans.

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Familial Diaphragmatic Hernia

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SUMMARY

Familial occurrence of diaphragmatic hiatal hernia has been reported often. Herein reported is a family in which eight of eleven children had hiatal hernia.

Hiatal hernia must be considered as a possible etiological factor in all upper abdominal, cardiac or respiratory disturbances from infancy to senility. The lesion may be present in a patient who has none of the symptoms usually associated with such defects.

Conservative treatment is indicated unless serious symptoms definitely referred to the hernia are present and not adequately controlled by conservative means.

PRIOR to 1921, references to diaphragmatic hernia were few and largely confined to the congenital and traumatic types found at autopsy. Since then the literature on diaphragmatic hernia has become very extensive. The classification of such hernias has undergone some change while the embryological factors contributing to the congenital defects in the diaphragm have been described in detail.[9, 17]

There have been relatively few references to the genetic factors involved in diaphragmatic hernias although the familial association of abdominal wall weakness, varicose veins and related structural defects has long been noted. De Azevado[5] described a family (14 people in three generations) in which five members had hernia (one umbilical, four inguinal) and five others had definite endocrinopathic conditions. De Azevado quoted Birkenfeld: "Heredity plays a dominant role in the etiology of hernia." Schrieger[19] described a woman in whom diaphragmatic eventration developed after delivery. Weakness of the abdominal wall was noted in nearly all members of the family. Among the woman's five children there were two with inguinal hernia, one with umbilical hernia, one with congenital diaphragmatic hernia and dextrocardia. In addition, the woman's father, mother, four sisters and three brothers had varices. Myles[13] reported upon a woman 76 years of age and her daughter, aged 54, both with congenital short esophagus and hiatal hernia, and quoted M. Georges as describing a family in which a mother of six children had congenital hernia of the diaphragm; of the children one had hernia of the same kind, one had an umbilical hernia and two had inguinal hernias. Galliano,[8] Shiro and Benjamin,[20] and Bock and co-workers[2] reported other instances of multiple hernias in the same family.

This presentation deals with esophageal hiatus hernias in eight children in one family.

Diaphragmatic hernia is important in the differential diagnosis of a number of vague or complex symptoms in the upper abdomen and thorax. Harrington[10] stressed that more general interest in this subject is necessary since proper diagnosis is not made in many instances until complications have occurred.

Esophageal hiatus hernia has been aptly named the "masquerader of the upper abdomen" by Harrington.[10] As such it should be considered by the general practitioner and clinician as a cause or an associated etiological factor in all conditions giving rise to abdominal or thoracic symptoms.

This is especially true in newborn babies with cyanosis, respiratory difficulty or vomiting—symptoms which may be associated with congenital hernia.[3, 10] Thorek[21] stressed that this is not uncommon and that sudden deaths in the first few weeks of life attributed to dextrocardia, enlarged thymus, or cardiac lesions may be due to diaphragmatic hernia. Cyanosis is the most constant symptom, and a peculiar weak cry has been described. Prompt recognition and surgical correction of diaphragmatic hernia in babies may be life-saving, as was demonstrated by Orr and Neff[16] and Truesdale.[22]

In older age groups hiatal hernia has been diagnosed in a greatly increased number of cases in the last decade due to recognition of the importance of this entity and newer roentgenologic techniques.

Akelund was quoted by Levy and Duggan[13] as regarding the presence of small sacless diaphragmatic hernias as a normal development accompanying old age.

Brunk[4] reported 308 cases of esophageal hernia observed in 3,448 barium gastrointestinal examinations in a two-year period at Boston City Hospital. Esophageal hernia was the second most common pathological finding in that series. The incidence of 8.9 per cent compared with 20.4 per cent for duodenal ulcer, 3.5 per cent for gastric ulcer and 2.9 per cent for carcinoma. Brunk cited Nuzum as as having reported hiatal hernia in 12.27 per cent of 951 patients. Olson and Harrington[15] emphasized the great etiologic importance of the age factor in reporting that 76.6 per cent of hiatal hernias occurred in the 50- to 80-year age groups. Schatski[18]

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estimated that hiatal hernia occurred in 73 per cent of the aged.

Levy and Duggan[13] pointed out that the esophageal opening is the only opening in the diaphragm completely surrounded by muscle tissue and that herniation could result from a loss of elasticity in the fibrous tissue around the ring, insufficient muscle fiber, changes in the abdominal pressure such as are caused by coughing, meteorism, straining at stool, tumor, and repeated pregnancies.

Harrington[9] stressed the embryological factor of delayed descent of the stomach from its origin in the cervical region with closure of the crural ring about a portion of the stomach that later descends, leaving a large hiatus that is closed only by the hiatal elastofibrous membrane.

Dey and co-workers[6] and other investigators have demonstrated definite shortening of the esophagus by vagal stimuli such as traction on the liver, overdistention of the gallbladder, dilation of the cystic duct and even scratching of the peritoneum. Everingham[7] expressed belief that intra-abdominal pressure plays only a small role in comparison to (1) loss of ligamentous and muscle tone and (2) neurogenic imbalance.

SYMPTOMS

The symptoms of hiatal hernia are of interest due to their complexity, insidiousness, and progressive character. The principal symptom in the early stage of herniation is discomfort in the epigastrium or substernal area, especially after a heavy meal or on lying down immediately after such a meal. Fullness and distress may come on after only a cup of coffee or a glass of water. There may be progressively increasing pain, later referred to the subscapular area or radiating down the left arm.

Dysphagia is complained of in 75 per cent of such cases, according to Olson and Harrington.[15] Another symptom is epigastric and substernal distress that may be referred around the costal margins into the left thorax, neck and arms.

Lentz[12] reported T-wave inversion in electrocardiograms, reflecting coronary insufficiency due to lowered blood pressure and increased venous pressure associated with venous system engorgement resulting from increased intrathoracic pressure caused by hiatal hernia.

Beckh and Huffman[1] pointed out that symptoms simulating angina pectoris may be caused by diaphragmatic hernia and they stressed differentiation between angina caused by coronary artery disease and that caused by hiatal hernia. Jones[11] reported that the pains of hiatal hernia radiating to the shoulder, to the acromial tip or to the left ring finger may be relieved by nitroglycerin, but the relief is not so constant as that given by the drug in cases in which the pains are due to coronary disease. Jones also stated that hiatal hernias, regardless of size, may be completely asymptomatic.

Anemia has always been classified as a major symptom associated with hiatal hernia.[2, 8, 9]

DIAGNOSIS

The diagnosis of hiatal hernia is made by roentgen examination. Many investigators have stressed that a small hernia, even though causing definite symptoms, may be missed on the first examination. For this reason, x-ray examination should be repeated in cases of unexplained upper abdominal or thoracic distress.

Esophagoscopy, by which mucosal congestion or erosion at the cardiac end of the esophagus or in the herniated portion of the stomach may be observed, is useful in localizing the source of referred pain.

CASE REPORTS

In the following cases, six sisters and two brothers (twins) of a Jewish family, ranging in age from 52 to 68, had hiatal hernias of various sizes. One male and two female children of these persons did not have hiatal hernia. The mother of this group had ten children and is said to have been very active and never ill, while the father had dyspnea and asthma.

Case 1. The patient was a woman 68 years of age. The height was 66 inches and the weight 200 pounds. A 10 cm. hiatal hernia was observed in an x-ray film of the chest made prior to amputation of a breast for cancer. There were no symptoms referable to hernia.

Case 2. The patient was a 66-year-old nullipara. The height was 61½ inches, the weight 142 pounds. The patient had had anemia until age 19 (chlorosis?). She had always been constipated. An operation to relieve rectal stricture was done in 1905. Mild gastric hyperacidity had occurred from time to time over a period of several years. About six years had elapsed since the last attack. There was complaint of a sense of fullness in the epigastrium and shortness of breath on lying down after a heavy meal. There was no vomiting, nausea, epigastric pain, or eructation. The stools were not tarry. Erythrocytes in the blood numbered 3,750,000 per cu. mm. and the hemoglobin value was 65 per cent. A hiatal hernia 8 cm. in diameter was observed in an x-ray examination.

Case 3. The patient was a woman 65 years of age. The height was 61½ inches and the weight 162 pounds. Anemia at age 55 was corrected by iron injections. The patient was chronically constipated in younger life but had not been for the past few years. There was some abdominal gas but no other symptoms referable to hernia. A hiatal hernia 4 cm. in diameter was roentgenographically diagnosed.

Case 4. The patient was a woman, aged 64 years. The height was 65½ inches, the weight 165 pounds. There was one child, living and well. The patient had always been well until two years previously. Then pain associated with chronic cholecystitis developed. A 10 cm. hiatal hernia was observed in a roentgen examination of the gastrointestinal tract, but there were no symptoms referable to the lesion.

Case 5. The patient was a women 63 years of age. The height was 62 inches and the weight 151 pounds. There was one child. The history was negative for gastrointestinal symptoms. A 3.5 cm. hiatal hernia was observed in a roentgenographic examination.

Case 6. The patient was a woman 54 years of age. The height was 63½ inches and the weight 206 pounds. There were no children. Fourteen years previously an operation for "some pelvic condition" was followed by bowel obstruction with peritonitis, and fecal fistula had developed as a sequel to a second operation. The body weight had dropped

to 98 pounds during eight months of hospitalization. The abdomen at the time of the present examination was large and pendulous. A ventral hernia was noted. A small hiatal hernia was observed in roentgenographic studies, but there were no symptoms referable to it.

Case 7. The patient was a man 52 years of age. The height was 66 inches and the weight 203 pounds. Formerly a boilermaker and iron worker, the patient had always been in good health. A very small hiatal hernia was present but there were no symptoms referable to the lesion.

Case 8. The patient, a twin of the patient in Case 7, had always had good health. The height was 66 inches and the weight 193 pounds. A 5 cm. hiatal hernia was observed in x-ray examination. There were no symptoms of gastrointestinal disease.

COMMENT

In only one of these eight cases did the patient have definite symptoms associated with the hiatal hernia. None were operated upon for repair of this condition. Two of the patients (Cases 4 and 6) have been followed by the author for 17 years since discovery of the hiatal hernias. The patients have had no symptoms referable to those lesions and no treatment was given specifically for them.

TREATMENT

Treatment of hiatal hernias is primarily conservative and dietary. Small frequent meals will often prevent most of the symptoms. Bland diet is of value. Irritating foods and drinks that cause mucosal turgescence or increased gastric distention should be eliminated. Belladonna derivatives are effective in relieving symptoms. Operation is indicated only if serious symptoms directly referable to the hernia cannot be adequately controlled by conservative measures.

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Summer Diarrhea in the San Joaquin Valley

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SUMMARY

In laboratory, epidemiologic and clinical studies of 85 patients with diarrhea admitted to the General Hospital of Fresno County and the San Joaquin County Hospital during part of the summer of 1949 the following features were noted:

1. Cultures were positive for Shigella in about 45 per cent of the cases in the San Joaquin County Hospital and in about 15 per cent of those in the Fresno County Hospital.

2. In 80 per cent of cases in which there was gross blood in the stools before the third day of hospitalization, Shigella grew on cultures. No gross blood was noted in 27 per cent of cases in which Shigella was demonstrated.

3. The cases in which Shigella was demonstrated did not differ greatly from the others with regard to fever, leukocytosis, or response to therapy.

4. Salmonella organisms were not grown on cultures in any case.

5. Most of the patients were infants younger than one year of age.

6. Poor socio-economic and hygienic conditions characterized the households from which these county hospital patients came.

7. Household follow-up studies indicated that there had been one or more instances of diarrhea among household associates of approximately half the hospitalized patients at some time during the month prior to admission.

STUDIES of the severe annual summer diarrhea problem in the San Joaquin Valley were conducted in Stockton and Fresno during the latter part of the summer of 1949. Information was sought particularly concerning etiologic factors, mode of transmission, and clinical course. The patients were in the San Joaquin County Hospital in Stockton and the Fresno County Hospital in Fresno.

The studies were carried out by two medical students under the direction of Arthur C. Hollister, Jr., M.D., director of the acute communicable diseases service of the California State Department of Public Health, and his staff.

Eighty-five cases were studied. Forty-four of the patients were admitted to the San Joaquin County Hospital during the period July 10 to September 13, 1949, and 41 were admitted to the Fresno County Hospital during the period August 6 to September 6, 1949.

The history and physical findings in each case were noted on entrance into the hospital and recorded on statistical card forms. The treatment given and the course of the disease were recorded daily.

Smears from rectal swabs on Salmonella-Shigella and eosin-methylene-blue culture plates were made at the bedside on entry. At Fresno, suspicious colonies isolated at the hospital laboratory were sent on plain agar slants to the State Bacteriological Laboratory at Berkeley for identification. At Stockton, separate culture plates were studied by the hospital laboratory and by the district health department laboratory before being sent to the State Laboratory for positive serological identification. In two instances one laboratory isolated an enteric pathogen not reported by the other.

A stool specimen for future viral study was obtained on entry, sealed in a specimen bottle, and frozen on dry ice for later shipment to the State Health Department virus laboratory in Berkeley. Field epidemiological studies at the homes of the patients were made possible through efforts of the Fresno and San Joaquin county public health nurses.

LABORATORY, EPIDEMIOLOGIC AND CLINICAL DATA

Table 1 shows the number of deaths in the groups studied at both hospitals. A few patients admitted for diarrhea to each hospital were not included in the study because of occasional necessary absences from the hospital by the observer or because diarrhea was determined to be a secondary feature of the illness after admission. Dehydration was the main criterion for hospital entry.

TABLE 1.—*Total Number of Cases and Deaths*

	Fresno (In 31 days)	Stockton (in 65 days)	Totals
Cases studied	41	44	85
Deaths	5	2	7

Table 2 shows the results of cultures at both hospitals. At Fresno, Shigella flexneri was recovered in

One of the authors (Drake) was a junior student, Stanford University School of Medicine, the other (Long) a senior student, University of California School of Medicine, at the time of this study.

TABLE 2.—*Enteric Pathogens Isolated from Rectal Swabs*

	Fresno		Stockton	
	Positive	Negative	Positive	Negative
Results of culture for enteric pathogens....	6	35	20	24

five cases and Shigella ambigua in one. At Stockton Shigella flexneri was recovered in 13 cases, Shigella sonnei in one case, and Shigella of undetermined species in six cases. A few cultures of Proteus strains were noted. No strains of Salmonella were isolated in either group of cases. As Hardy and Watt[1] observed, Shigella is often present even though it is not demonstrated by single cultures of rectal swabs. They noted, moreover, that if the organism is present it is more often demonstrated on rectal swab cultures than on stool cultures. Thus it is probable that in the series here reported Shigella was present in more cases than those in which it was recovered.

TABLE 3.—*Age Distribution of Patients in the Two Groups*

	Fresno	Stockton
6 months or under	21	20
7-11 months	6	5
1-4 years	10	16
5 years or more	4	3
Totals	41	44

Over half of both groups of patients were infants, with a considerable proportion of children of preschool age in the Stockton group (Table 3). None of the infants under one year of age in the Fresno group had stool cultures positive for Shigella, whereas for one-third of those in the Stockton group the organism grew on stool cultures (Table 4).

TABLE 4.—*Age Distribution of Patients with Stool Cultures Positive for Shigella*

	Fresno	Stockton
6 months or under	0	7
7-11 months	0	1
1-4 years	3	10
5 years or more	3	2
Totals	6	20

An attempt was made to detect a correlation between the age of the patient and the duration of illness before admission to the hospital in an effort to determine whether or not hospitalization of an infant with diarrhea is delayed longer than it is for a patient more than one year of age. Table 5 shows that in the Fresno group only one of the patients more than one year of age had been ill for over four days at the time of admission, and in the Stockton group only two. In both groups, approximately one-third of the patients less than one year old had been ill for more than four days. It is of interest that four of the five deaths in the Fresno group were in infants, three of whom had been ill four days or less at the time of admission. Both of the Stockton patients who died—one a two-week-old baby and the other a six-year-old child—had been ill for four days or less when admitted.

TABLE 5.—*Patients Grouped with Respect to Age and Duration of Illness on Admission*

	1 Yr. or Less in Age	Over 1 Yr. in Age	Totals
Fresno:*			
Ill 4 days or less on entry	18	10	28
Ill more than 4 days on entry	10	1	11
Totals	28	11	39*
Stockton:			
Ill 4 days or less on entry	18	16	34
Ill more than 4 days on entry	8	2	10
Totals	26	18	44

*In two of the 41 cases in Fresno, duration of illness was not determined.

RACIAL DISTRIBUTION

There was a predominance of patients of the Mexican race. In both areas, virtually all the patients came from camps for migratory laborers, from temporary dwellings in agricultural areas, or from poorer districts of incorporated areas. Poor sanitary conditions prevailed among the homes from which the patients came, both in the Stockton and the Fresno groups. Outside well water, outdoor privies, exposed food, and large numbers of flies were contributing factors.

TABLE 6.—*Racial Distribution of 85 Patients with Diarrhea*

	Fresno	Stockton
Negro	1	7
Mexican	29	21
Other	11	16
Totals	41	44

Dehydration or inadequate nutrition or both were associated conditions in patients under three months of age. In general the body weight of these patients at the time of admission was only slightly greater than the birth weight and in a few cases it was actually less than the weight at birth.

Visits to the households of hospitalized patients revealed in many instances that there had been other recent cases of diarrhea within the same household or living area.

Correlation of clinical features with the demonstrable presence of Shigella is noted in Table 7.

In both areas the patients were having three to ten liquid stools per day at the time of admission. The stools were yellow or green and many contained mucus. Blood was observed at some time in the stools of ten of the 41 Fresno patients and 15 of the 44

TABLE 7.—*Correlation of Clinical Features and Demonstration of Shigella on Culture*

	Fresno (4 weeks)		Stockton (9 weeks)	
	Total (41 cases)	Shigella (6 cases)	Total (44 cases)	Shigella (20 cases)
Gross blood noted in stools	10	6	15	14
No gross blood noted in stools	31	0	29	6
Maximum temperature over 102° F. (rectum)	17	3	24	14
Leukocytes over 10,000 per cu. mm.	22	2	22	11
Diarrhea duration over seven days after therapy	19	2	24	13

Stockton patients. Blood was noted in stools of each of the six Fresno patients who had stools positive for Shigella, and in 14 of the 20 Stockton patients in whose feces the organism was demonstrated. Temperatures (rectal) were not related to Shigella culture. They reached 106° F. in a few cases and 101 to 102° F. in most other cases, usually dropping almost to normal shortly after antibiotics and parenteral fluids were administered. Moderate or severe dehydration was a conspicuous finding in most of the patients (this was the main criterion for hospitalization). Leukocytosis was not found to be related to the presence of demonstrable Shigella, nor was the response to therapy.

Therapy in both groups consisted essentially of replacement of fluids and electrolytes by intravenous or clysis methods, and the administration of antibiotics, notably absorbable and non-absorbable sulfa drug mixtures, penicillin and streptomycin. Results of postmortem examination of three of the seven patients who died indicated that adrenal hemorrhage or exhaustion contributed to the fatal outcome. Hospital stay varied widely in both groups; the majority of patients were hospitalized from five to 15 days.

Fresno County Hospital.

ACKNOWLEDGMENT

This study was initiated and planned by Dr. A. C. Hollister, Jr., of the acute communicable disease service, California State Department of Public Health. He and his assistant, Dr. H. P. Wick, gave several consultations on problems encountered in the study. The staffs of the Fresno and San Joaquin County Hospitals and county health departments were most accommodating, and without their full cooperation this study could not have been made. Dr. Henry Brainerd, of the University of California School of Medicine, advised in the writing of the paper.

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The Incidence of Carcinoma of the Prostate in Cirrhosis of the Liver

Varner J. Johns, Jr., M.D., and Albert Hirst, Jr., M.D., *Los Angeles*

SUMMARY

Cirrhosis of the liver has no effect upon the incidence of carcinoma of the prostate.

THERE is an increasing volume of clinical and experimental evidence to indicate that certain manifestations of cirrhosis of the liver are a result of hyperestrogenism due to the inability of the liver to inactivate estrogens. Among the clinical findings suggesting estrogen overactivity are gynecomastia, spider angiomata, and testicular atrophy. The literature reviewing the endocrine changes in cirrhosis has recently been summarized by Lloyd and Williams.[5]

Estrogens have been shown to have an inhibiting effect on normal prostatic epithelium in experimental animals[1] and man[3] and on the malignant cells of prostatic carcinoma in man.[2, 4, 7] It seems reasonable to suggest that the endocrine disturbances frequently associated with cirrhosis might also be associated with an altered incidence of carcinoma of the prostate gland—most likely with decreased incidence. The autopsy records of the Los Angeles County General Hospital were considered to be particularly suited to testing this hypothesis, because of the relatively high incidence of cirrhosis of the liver in patients at this hospital. The condition has been observed in about 5 per cent of autopsies in recent years.

METHOD OF STUDY

This study was based on a review of 15,522 consecutive autopsies performed during an eight-year period from 1939 to 1946 inclusive at the Los Angeles County General Hospital. In order to select an age group in which both cirrhosis of the liver and carcinoma of the prostate occurred with sufficient frequency to determine a statistical relation in the incidence of the two diseases, it was necessary to limit the study to males over the age of 50. This eliminated only one case of carcinoma of the prostate and 39 per cent of the cases of cirrhosis of the liver in males. The per cent of males over 50 years of age with carcinoma of the prostate and the per cent with cirrhosis of the liver was determined. The incidence of prostatic carcinoma in all autopsied males over 50 years of age was compared with the incidence of carcinoma of the prostate in males over 50 who also had cirrhosis of the liver. A similar comparison was also made by decades.

In assessing the frequency of carcinoma of the prostate and cirrhosis of the liver, the anatomic diagnosis on the autopsy protocol, usually verified by histologic data, was accepted. Histologic material on cases in which carcinoma and cirrhosis were associated was examined before the diagnoses were accepted.

RESULTS

In the 15,522 autopsies there were 779 cases of cirrhosis of the liver. Males constitute 525 or 67.4 per cent of this group. The age distribution is shown by decades in Table 1. Among the 15,522 autopsies were 175 cases of carcinoma of the prostate. There were nine cases in which carcinoma of the prostate and cirrhosis of the liver were associated (Table 2). Of the total number of autopsies, 5,934 were done on males over the age of 50. Of the 175 cases of prostatic carcinoma, 174 occurred in the age group over 50, an incidence of 3.1 per cent. Of 316 males over 50 with cirrhosis of the liver, nine (2.8 per cent) had prostatic carcinoma. These figures indicate that there is no significant difference in the in-

Table 1.—*Patients with Cirrhosis of the Liver and Carcinoma of the Prostate*

Age Groups (Years)	Cirrhosis of the Liver	Carcinoma of the Prostate
Under 20	3	....
21 - 30	13	....
31 - 40	68	....
41 - 50	125	1
51 - 60	133	16
61 - 70	109	47
71 - 80	63	83
Over 81	11	28
Total	525	175

Table 2

	Age Groups (Years)					
	51-60	61-70	71-80	81 and over	61-80	Total over 50
Males with carcinoma of the prostate and cirrhosis of the liver	1	4	3	1	7	9
Males with carcinoma of the prostate	16	47	83	28	130	174
Males with cirrhosis of the liver	133	109	63	11	172	316
Total males (autopsied)	1729	1965	1687	553	3652	5934

Presented before the Section on Pathology at the 79th Annual Meeting of the California Medical Association, San Diego, April 30-May 3, 1950.

From the Departments of Internal Medicine and Pathology of the Los Angeles County General Hospital and the College of Medical Evangelists.

cidence of carcinoma of the prostate in cases with or without cirrhosis in males over 50 years of age. In the nine cases in which cirrhosis and prostatic carcinoma occurred together, not one of the patients was found to have had any of the previously mentioned clinical manifestations of estrogen overactivity. At autopsy gynecomastia or spider angiomata were not observed in any of the nine cases, and in only one of them were the testes described as "small."

A comparison was made of the incidence of cirrhosis of the liver in cases with and without carcinoma of the prostate. Of 5,760 males over the age of 50 without carcinoma of the prostate, 316 (5.5 per cent) had cirrhosis of the liver. Of the 174 patients in the same age group with carcinoma of the prostate, nine (5.2 per cent) had cirrhosis of the liver. These figures indicate that in males over 50 years of age cirrhosis of the liver occurred as frequently in those with carcinoma of the prostate as in those without, again demonstrating an absence of interrelationship between the occurrence of the two diseases. The incidence of cirrhosis of the liver in patients with carcinoma of the prostate showed little variation from the incidence of the disease in patients without carcinoma of the prostate.

The incidence of carcinoma of the prostate in patients with cirrhosis of the liver, when analyzed by decades, showed little variation from the usual incidence of this malignancy. In both those with and without cirrhosis of the liver, the incidence of carcinoma of the prostate increased as expected in the older age groups. The apparent increase in the incidence of carcinoma of the prostate in the group of patients over 81 years of age with cirrhosis of the liver (Table 3) cannot be considered significant because of the small number of patients in that group (see Table 2).

Table 3

	Age Groups (Years)					
	51-60	61-70	71-80	81 and over	61-80	Total over 50
Incidence of carcinoma of prostate in patients without cirrhosis	1.0%	2.5%	5.1%	5.2%	3.7%	3.1%
Incidence of carcinoma of prostate in patients with cirrhosis	0.7%	3.7%	4.8%	9.1%	4.1%	2.8%
Incidence of cirrhosis in males without carcinoma of prostate	7.8%	5.7%	3.9%	2.1%	4.9%	5.5%
Incidence of cirrhosis in patients with carcinoma of prostate	6.2%	8.5%	3.6%	3.6%	5.4%	5.2%

DISCUSSION

It would seem reasonable to suggest that excessive estrogenic activity would inhibit prostatic epithelium and cause a decrease in the incidence of carcinoma of the prostate. If, however, it is true that prostatic carcinoma begins in the atrophic epithelium of the gland,[6] it is conceivable that an increased incidence of malignancy might be anticipated. Huggins[3] demonstrated that estrogens act primarily on the anterior rather than the posterior lobe of the prostate, which is believed to be the site of origin of most prostatic carcinomas. In accord with this concept no decreased incidence of this malignancy in the presence of hyperestrogenism would be expected.

The data set forth in this presentation indicate that the incidence of carcinoma of the prostate in males over 50 years of age who have cirrhosis is practically identical with the incidence in those who do not have cirrhosis. It may be significant that in none of the nine cases in which cirrhosis of the liver and carcinoma of the prostate were associated was there clinical evidence of estrogen overactivity. Because of the infrequency with which spider angiomata, gynecomastia, and testicular atrophy were described clinically, absence of these lesions in so small a group can have no statistical significance.

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CASE REPORTS

Tympany Over the Liver in Hepatic Abscess Caused by Clostridium Welchii

Tuberculous Pericarditis — Treatment with Para-aminosalicylic Acid and Intermittent Streptomycin

Tympany Over the Liver in Hepatic Abscess Caused by Clostridium Welchii

Report of a Case

Marshall J. Fiese, M.D., *Fresno*

TYMPANY in the center of the area of normal liver dullness has not, so far as I know, been previously described in cases of liver abscess. In a patient recently observed, this unusual physical sign was the first evidence of a huge gas-containing abscess of the liver, secondary to empyema of the gallbladder.

About 10 per cent of pyogenic liver abscesses arise by direct extension from the gallbladder.[3] Occasionally Clostridium welchii is found in diseased biliary passages, although less commonly than Escherichia coli, streptococci, and staphylococci.[2] Now and then members of the Clostridium group are recovered from liver abscesses.[1] On rare occasions gas has been demonstrated in hepatic abscesses by roentgenographic examination.[1]

A 67-year-old Swedish packer entered Stanford University Hospitals on August 5, 1948, because of severe right upper quadrant pain for ten days. Two years previously an appendectomy had been done for transient, vague right upper quadrant pain. For several months the patient had been known to have pernicious anemia, which had responded rapidly to injections of liver extract. Two weeks before entry he noticed steady, mild right upper quadrant pain, which in the next several days became much worse. Two days before entry the pain had subsided somewhat, but the patient began having severe chills and fever, and became delirious.

At the time of admission the patient was weak, tired, sweating, and disoriented, with a swinging fever as high as 40° C. There were crackling rales at both lung bases posteriorly. The liver was enlarged and tender. In the midst of the area of liver dullness, which extended from about the level of the fifth costochondral junction to 5 cm. below the costal margin, was an area of loud, resounding tympany 10 cm. in diameter (see Figure 1).

There were 4,100,000 erythrocytes per cu. mm. and 14.7 gm. of hemoglobin per 100 cc. of blood. Of the 15,600 leukocytes per cu. mm., 88 per cent were polymorphonuclear cells, 17 per cent banded. Roentgenograms showed a large area of decreased density in the liver, with a shifting fluid level (see Figure 2). Clostridium welchii was cultured from the blood.

There was no apparent response to penicillin and streptomycin. On the sixth hospital day laparotomy and cholecystectomy were carried out. The liver was enlarged, firm, and as tympanitic as a drum. The tense, distended gallbladder contained 800 cc. of foul pus. A perforation in the gallbladder wall entered a cavity in the liver 20 cm. deep, full of pus and gas, from which E. coli and Cl. welchii were cultured. Two days following operation the patient, in delirium, pulled out the drains which had been left in the

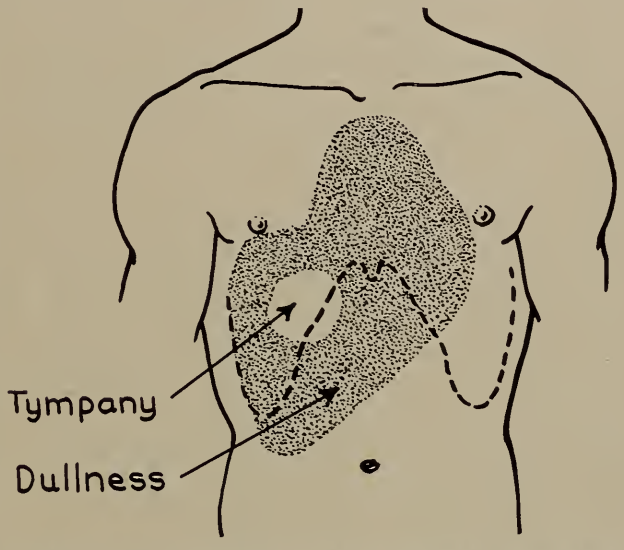

Figure 1.—Pattern of cardiac and hepatic percussion dullness and tympany in a case of abscess of the liver due to Clostridium welchii.

Figure 2. — Roentgenogram of the abdomen, showing area of decreased density with fluid level, in a case of abscess of the liver due to Clostridium welchii.

From the Department of Medicine, Stanford University School of Medicine, and the Stanford University Hospitals.

abscess cavity, so that a second laparotomy was necessary ten days later. Penicillin and streptomycin were continued for two weeks. The wound drained for six weeks, but convalescence was otherwise uneventful. The tympany over the liver disappeared.

COMMENT

The signs usually mentioned as indicative of large hepatic abscesses are enlargement and tenderness of the liver, friction rubs over the hepatic area, bulging and inflammation of the abdominal wall in the right upper quadrant or flank, and fixation of the right diaphragm. To this list may be added tympany over the liver if the abscess contains gas. Although this sign must be rare indeed, it is so striking when present that it may prove to be of diagnostic value, and should be sought when a liver abscess is suspected.

SUMMARY

Tympany in the center of the area of normal liver dullness characterized a case of gas bacillus abscess of the liver, secondary to empyema of the gallbladder. As far as has been determined, this unusual physical sign has not been previously described.

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Tuberculous Pericarditis—Treatment with Para-aminosalicylic Acid and Intermittent Streptomycin

Report of a Case

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STREPTOMYCIN is an effective antibiotic in the treatment of tuberculous pericarditis as well as in the treatment of other tuberculous lesions, as described in a number of recently published case reports.[3, 4, 6, 7] In these cases streptomycin was used in the usual daily regimen consisting of several small doses per day. Recently this regimen has given way to an intermittent method in which the antibiotic is administered in a single large dose at intervals of days to a week, with or without the concurrent administration of such drugs as PAS (para-aminosalicylic acid). The efficacy of the intermittent method has been demonstrated in the treatment of pulmonary[1, 2, 8] and laryngeal[5] tuberculosis. The following case is reported to demonstrate its efficacy in the treatment of tuberculous pericarditis.

In this case PAS was used concurrently. Clinical improvement began immediately after the intramuscular injection of 2 gm. of streptomycin and daily oral administration of PAS. The PAS was stopped after two weeks because of a febrile reaction and granulocytopenia. Therapy was then continued with streptomycin, 2 gm. in each dose, at weekly intervals and convalescence was uneventful.

CASE REPORT

The patient was a 35-year-old Japanese housewife born in Los Angeles. Family history was not significant. Past medical history included an attack of pleurisy at the age of 15. One child was born in 1941.

The present illness began in 1944 when the patient was 30 years of age. At that time she was interned at a California camp for Japanese. In May of that year there was an acute febrile episode and the patient was in bed at the camp hospital for four days. Eight months later she began to cough, lose weight and to have pain of pleural type in the right chest. An infiltration in the upper lobe of the right lung was noted in a roentgenogram. The sputum contained tubercle bacilli. The patient was put to bed in the camp hospital and during the next three months there was a gain in weight from 110 pounds to 126 pounds. In April 1945 the patient was transferred to a Los Angeles County sanatorium. Modified bed rest was continued and the sputum was negative for tubercle bacilli. In August 1945 it was noted that the upper lobe of the right lung was atelectatic. The patient's activity was gradually increased.

In April 1946 the sputum again became positive for tubercle bacilli on concentrated smear. Cough increased, the sputum was blood-streaked, and there was slight fever. Bed rest was resumed. In repeated bronchoscopic examinations fibrous stenosis of the right main bronchus with a small area of granulation tissue was noted. Beginning at the end of August 1947 the patient was given a course of streptomycin consisting of 1 gm. daily in five divided doses for 70 days. Planigrams on several occasions in 1947 showed multiple small radiolucent patches in the atelectatic right upper lobe. The sputum remained persistently positive for tubercle bacilli. Therefore, three stages of a right thoracoplasty (seven ribs) were done in October to December of 1947. Following this procedure, the sputum was negative for tubercle bacilli.

Six months later, the sputum again became positive for tubercle bacilli and planigrams on two occasions in 1948 showed multiple radiolucent areas in the atelectatic right upper lobe under the thoracoplasty. Upon bronchoscopic examination the same degree of stenosis of the right main bronchus that had been noted before was observed but there was no active mucosal disease. In December 1948 tubercle bacilli from the patient were determined to be not resistant to streptomycin, so this antibiotic was given again in doses of 0.5 gm. intramuscularly once a day. Seven days later, right upper lobectomy was performed. During the operation the pericardium was inadvertently entered but the wound was repaired without incident. The patient made satisfactory recovery but had a low-grade fever for two weeks after the operation. Thereafter tubercle bacilli were never again isolated from the sputum or gastric washings.

Convalescence was uneventful for five months until May 22, 1949, when the patient began to have fever, dyspnea, a vague pressing pain in the left upper chest on coughing, increased cough with expectoration, and headache. These symptoms became worse during the next four days. Upon examination at that time fever and tachycardia were noted, and there was dyspnea but no cyanosis. Blood pressure was 110 mm. of mercury systolic and 90 mm. diastolic. The pulse was paradoxical. When the patient sat erect there was no venous distention in the neck, but when she lay down, the right external jugular vein became considerably engorged. The chest had the usual deformity of thoracoplasty on the right. The left hemithorax was barrel-shaped. The apex beat of the heart was not palpable. The heart was not ap-

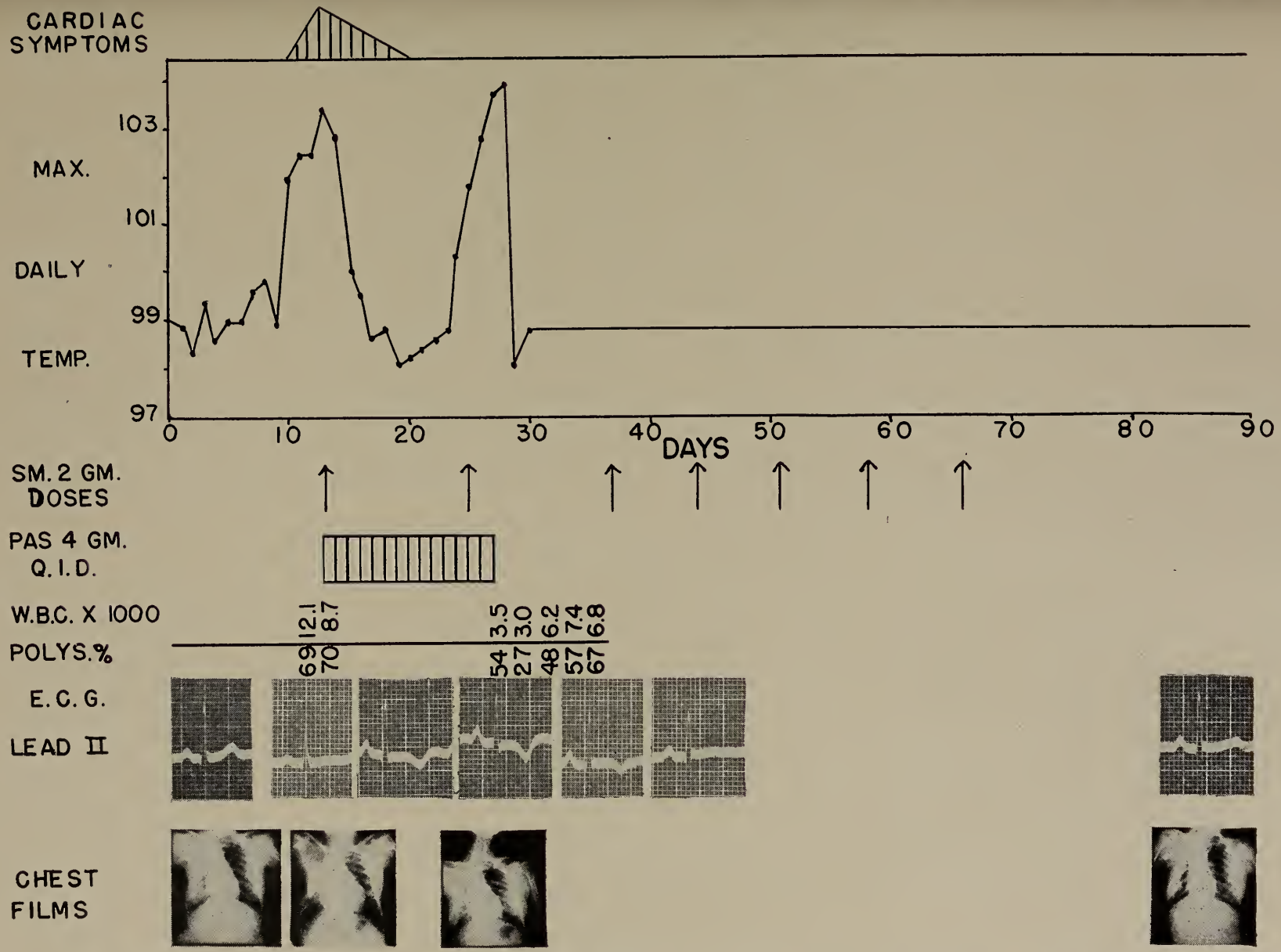

Figure 1.—Course of patient. Note response to one 2-gm. dose of streptomycin and daily oral PAS. Recurrence of fever, associated with granulocytopenia, was not influenced by another dose of streptomycin but disappeared on withdrawal of PAS. Electrocardiographic T-wave changes and heart size returned to normal 90 days after onset of pericarditis.

parently enlarged to percussion. Heart sounds were distant and a friction rub was audible in the midsternal line at the level of the third interspace with the patient supine; this rub almost disappeared when she sat up. The liver was neither palpable nor tender and there was no peripheral edema.

Roentgenograms showed an increase in the size of the heart in all diameters by comparison with previous films and the heart contour was pear-shaped. Fluoroscopy showed feeble cardiac pulsations, and a barium swallow revealed no abnormalities of the esophagus. An electrocardiogram showed flattened T-waves, by comparison with a former tracing, in all standard limb leads and in the six precordial CF leads. Leukocytes in the blood numbered 12,100 per cu. mm., with a normal cell differential. The urine was normal. A series of four daily blood cultures showed no growth.

On the fifth day of this illness, the patient's temperature reached a peak of 103.4° F. Pericardial paracentesis was performed and 250 cc. of blood-tinged fluid was aspirated. This fluid was sterile on culture for both pyogenic organisms and tubercle bacilli.

Following aspiration, the dyspnea was partially relieved, venous engorgement in the supine position was less, pulse pressure increased and paradoxical pulse was no longer noted. The course of the patient is shown in Figure 1.

On the sixth day of this illness friction rub was no longer audible. The patient was given 2 gm. of streptomycin intramuscularly and was started on 16 gm. of PAS daily in four divided doses by mouth. Response to this treatment was prompt. Fever and symptoms subsided in four days. An electrocardiogram showed deep inversion of all T-waves.

The temperature remained normal for seven days and the patient felt much better. She continued to take PAS by mouth without trouble although the stools were somewhat loose. However, on the eleventh day of PAS therapy fever developed again. The next day a second 2 gm. dose of streptomycin was given, but the temperature rose progressively during the following two days and the patient became nauseated and vomited. On the fourteenth day of PAS therapy, leukocytes numbered only 3,500 per cu. mm. On roentgenogram, some decrease in the size of the heart was noted, and the heart sounds were of good quality. There was no recurrence of signs of cardiac tamponade. Twenty cubic centimeters of Pentnucleotide® was given intramuscularly in two doses. An electrocardiogram showed deeper inversion of T-waves. PAS was discontinued with a diagnosis of drug fever and leukopenia.

There was an immediate drop of temperature in 24 hours from 104.2° F. to normal but the leukocyte count continued to be low for two days more and the granulocytes fell to 27 per cent. At the same time the platelet count was 135,000 per cu. mm. The leukocyte and granulocyte count rose to normal levels in three more days and the temperature remained normal. Therapy was continued with 2 gm. of streptomycin once a week for five doses, and 90 days after the onset of the pericarditis the electrocardiographic changes and the heart size had returned to normal. The patient remained asymptomatic except for slight cough and expectoration and slight dyspnea on exertion. Her activity was slowly increased. Sputum and gastric washings remained negative for tubercle bacilli, and the blood sedimentation rate (Linzenmeier) decreased to a normal level during the seven months after the onset of the pericarditis. The patient was discharged to home care in December 1949, one year after the right upper lobectomy, with a diagnosis of quiescent pulmonary tuberculosis and healed tuberculous pericarditis.

COMMENT

Following an unsuccessful thoracoplasty on a patient with pulmonary tuberculosis, resection of the right upper lobe was performed. During the operation the pericardial sac was broken into. Five months later pericarditis with effusion developed. Although culture of aspirated fluid was negative for tubercle bacilli, it appears probable that the pericarditis was tuberculous and that the pericardial sac was infected at the time of the lobectomy. The efficacy of therapy with streptomycin and PAS was indicated by the prompt response that occurred. It is not certain whether one drug or the other was effective in itself, but the combination was successful. The recurrence of fever with leukopenia is attributed to the PAS, because these reactions subsided when PAS was withdrawn and streptomycin was then continued without incident.

The minimal effective dosage of streptomycin for the treatment of tuberculous pericarditis has not been determined. In one of the cases reported by Johnson and Bercu the patient recovered following 0.1 gm. of streptomycin every four hours for a total of 7.5 gm., although later the patient developed chronic constrictive pericarditis requiring surgical relief. In the case reported herein, improvement followed a single two gm. dose of streptomycin and treatment with PAS for only two weeks. Whether the resumption of streptomycin was necessary to the cure of the pericarditis is uncertain; but if it was necessary, then a dosage schedule of 2 gm. once a week sufficed.

SUMMARY

A patient with tuberculous pericarditis and effusion was successfully treated with para-aminosalicylic acid and intermittent streptomycin. PAS caused a transient drug fever and granulocytopenia.

P. O. Box 500.

The authors were assisted by the Western Trudeau Streptomycin Laboratory, Olive View, California, aided by Research Grant 541, United States Public Health Service.

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EDITORIALS

Civil Defense — An Urgent Medical Problem

Modern methods of warfare and particularly atomic warfare have presented the medical profession with tremendous problems and responsibilities. It is imperative that we accept these responsibilities and make adequate preparation at once.

Many physicians do not realize the urgency and necessity for the immediate formulation of plans for civil defense and major disaster relief. At any moment the major cities of this great nation may undergo enemy attack without warning. Try to visualize the calamity which could befall any city which had no plan to follow in event of major disaster. One, two, or three atomic bombs properly placed in any major city would kill and injure thousands of civilians, would destroy hospitals and medical personnel, would create the need for thousands of pints of blood, and would raise many other problems. And it must be recognized that bacteriological and chemical warfare may also be used in conjunction with atomic weapons.

Atomic warfare does not mean the end of civilization nor necessarily the end of any nation. The atomic bomb is the most powerful physical weapon that has been produced by man to date. With proper planning and training, and mutual aid agreements with surrounding areas, many lives can be saved. We have only to study the record of the British during the past war as contrasted with that of the Germans and Japanese. The British long before the war formed a civil defense organization which functioned very well during the war. The result was a great saving in lives and property. Moreover, because of the organization, it was possible to maintain vital war work. On the other hand, the Germans and Japanese, who apparently did not recognize the necessity for civil defense planning, suffered many unnecessary casualties, and the efficiency of their war industries was greatly impaired.

The fundamental precepts of civil defense are self-help and mutual aid. The success of civil defense depends upon thorough, intelligent and flexible planning and full cooperation at the national, state, county and, particularly, the community level. There is no need to wait for planning on the national level; with capable leadership, the basic local problems can always be best handled on the local level.

The general program of the medical and health services in preparing for civil defense is to provide for the augmentation, mobilization, organization, and direction of the medical and public health facilities, resources, and personnel of the regularly constituted health and medical organizations within the state. To these organizations falls the task of setting up safeguards for the health of the community—providing emergency care for the sick and injured and arranging for hospital treatment in the event of a major disaster resulting from attack by enemy forces, acts of sabotage, serious epidemics, or natural disasters of catastrophic proportions. Only by proper planning can maximum use be made of the personnel, existing facilities, equipment, and resources within each community.

Emergency medical service committees of county medical societies must make and put into effect as soon as possible plans for the following:

1. Staffing of existing and auxiliary facilities for the care of the sick and injured.

2. Expansion, selection of, and equipping the facilities for maximum operation under major disaster conditions.

3. The medical care and the evaluation of the sick and injured.

4. The standardization of the methods of treatment of certain injuries, such as burns and damage by radiation.

5. Training of personnel. Each physician has a definite obligation to learn all he can and to prepare himself to fit into his community civil defense program.

The public health services with the assistance of the medical profession should provide for the control of communicable disease, for environmental sanitation, for keeping vital records, and for mortuary services.

The radiological defense organization will provide for radiological monitoring, decontamination procedures, instrumentation, meteorology, special laboratories, and the training of special personnel.

Civil defense planning is here to stay. It must become a part of local, county, state, and national medical activities. Scientific programs should include papers on the medical defense against atomic weapons, the treatment of burns, principles of handling and sorting casualties, radiation sickness, and the collection and preservation of supplies. Civilian casualties may be higher than those suffered by the military. The civilian population of cities in strategic areas must be protected against the depletion of medical and allied personnel.

With regard to bacteriological warfare, generalized attacks against the population in industrial, communication and governmental centers might be launched by disseminating germs in sources of water and food supplies. For this reason all physicians and public health officials must be constantly on the alert and report all new diseases affecting animals as well as humans. All standard preventive measures must be constantly employed.

Not to act when danger threatens is to neglect a duty to the community which is accepted in the profession of medicine.

Tests for Advertisements

In a cover-to-cover perusal of even some of the more reputable medical journals, a reader need be no more than mildly critical to become painfully aware that some of the advertisements do not measure up to the quality of scientific articles appearing in these journals. Because sound standards of advertising obviously were needed to correct such shortcomings, the American Medical Association some years ago set up certain criteria which must be met in advertisements published in the various publications of the A.M.A.

As a means of offering similar standards for state medical journals, the A.M.A. later established the Cooperative Medical Advertising Bureau, now known as the State Journal Advertising Bureau of the A.M.A. This bureau abides by the dicta of the various councils and committees of the A.M.A. and exercises a self-determined authority over the acceptance of advertising of non-therapeutic products such as cigarettes, beverages and other items of general public interest.

With the exception of Illinois, all state medical journals have at one time or another been affiliated with the A.M.A. state journal group. The New York State Journal of Medicine withdrew from the group some years ago and in 1947 the Rhode Island and California journals likewise struck out on their own. We in California reached this decision for two principal reasons: (1) We wanted a more concentrated representation of our journal, free of some of the restrictive regulations applied against items which were not Council-accepted but were generally accepted by the medical profession; (2) California Medicine had grown to a size where the establishment of its own advertising department was considered a necessity for the assurance of sound principles of advertising content and good business methods.

When California Medicine withdrew from the cooperative organization, the C.M.A. Council established a Committee on Advertising, which in its earliest meetings set up definite criteria for all advertising to be accepted in the journal. The questions asked by the committee and the rules it follows in determining whether or not a product is acceptable for advertising are:

1. Has the product been presented to any Council of the American Medical Association? If not acceptable, when was product submitted and for what reason was it not accepted?

2. Formula must be clearly stated on label and advertising copy in terms acceptable to California Medical Association.

3. The article must have the composition commonly acceptable for such products, as described in the U.S.P., N.F. or N.N.R., if defined therein. Otherwise, composition must be acceptable to the California Medical Association.

4. If name is to be descriptive, it should describe the product or its properties and not be suggestive of its uses.

5. Clinical evidence as to use and efficacy of product and its evaluation by unbiased authorities must be submitted.

6. Competent qualified personnel must be shown to be in charge of production and controls and assay work. Assay should be routinely applied to potent ingredients.

7. The advertiser must pursue an ethical policy in his advertising. The article must not be advertised to the laity.

The Committee on Advertising currently numbers six members of the C.M.A. and has 18 technical advisors or consultants. Meetings are held monthly or more often to consider advertisements placed in the journal and to scrutinize each. The purpose is to give assurance to the readers that claims made for the merits of advertised materials are not exaggerated or otherwise faulty.

As was to be expected, the establishment of such a rigid set of criteria brought about some initial problems between the journal and its advertisers or their agencies. Now, however, advertisers and the agencies representing them have come to recognize that since the service performed by the committee is of value to the readers of California Medicine, it is by this very fact a service which also enhances the commercial value of the advertisements appearing in the journal. The committee, on its part, has noted with pleasure the growing numbers of advertisers and advertising agencies who are cooperating in attaining the mutually beneficial aims of this program. It is a distinct credit to California Medicine that in the advertising profession our journal is considered second to none in advertising standards.

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NOTICES AND REPORTS

California's Non-Profit Community Blood Bank System

JOHN R. UPTON, M.D., *San Francisco*

Chairman, California Medical Association Blood Bank Commission

The first blood banks organized in California were established in 1938 in the Los Angeles County General Hospital acute unit and in the Highland Hospital at Oakland. Good Samaritan Hospital in Los Angeles established the first private hospital blood bank in 1939. The Irwin Memorial Blood Bank of the San Francisco County Medical Society was the first community non-profit bank in the country. It was established early in 1941. Since that time growth of blood banks has been rapid; unfortunately, the character of the banks has become diverse; future expansion depends on intelligent planning.

California is a state of diversified regions. It is made up of 58 counties. These counties range from mountainous uninhabited areas to teeming metropolitan centers. Long fertile valleys hemmed in by mountain chains allow ease of transportation by road and rail in the northern sector. In the southern part of the state the mountains, lying mostly in the east-west direction, impose natural transportation barriers. However, conveyance of people and produce by air is a most desirable method of year-round transportation. This method of conveyance will be more widely used in the future to transport blood to areas which are now deprived of this therapeutic agent.

The population of the state of California is approximately 12,000,000 people. Migration to the state is great; 13,000 new inhabitants settle in Los Angeles County every month. There are roughly 6,000,000 people in Los Angeles County alone. The public health problem of dealing with this huge number is enormous. The problems encountered in establishing a modern, community non-profit blood bank system are legion. Such obstacles, however, are being surmounted. This is primarily due to enlightened medical opinion and to the aid afforded by public officials who, sensing the crying need for stabilization in blood bank practices, lend their support.

It is of some interest to compare the needs for blood in war and in peace. During the entire three and one-half years of the last war a total of 17,022 Californians were killed in all of the services. During 1947, 9,536 people met violent death in California—a rate approximately twice as great as the annual rate during the greatest war of all time. The need for blood in helping to stop this destruction of human life is self-evident.

There are at present 49 blood banks operating in California. There are eight community non-profit type banks, 21 banks in private hospitals, 12 in county hospitals, three American Red Cross blood banks, and seven blood banks run by commercial houses. The majority of new banks planned are non-profit community institutions. This diversity in the character of blood banks has given excellent opportunity for comparative studies of the various kinds of banks, from those advocating "free blood for all" to the commercial laboratory bank run for profit.

There are approximately 41,000 hospital beds in California. It is generally accepted that the amount of blood needed for complete coverage is five units per hospital bed per year—205,000 units annually for California. In addition, approximately 40,000 units of plasma are needed each year. The average service charge throughout the country is $10 per unit. That calls for an expenditure of two and one-half million dollars per year for whole blood and plasma. If such a quantity of blood were obtained at commercial prices the sum would be doubled. The tremendous upsurge in population necessitates the

Read before the American Association of Blood Banks in Seattle, November 3-5, 1949.

building of new hospitals. This will result in more demand for blood and blood derivatives.

In April 1948 the California Medical Association appointed a Blood Bank Commission. Members of the commission are physicians well versed in hematology, pathology and blood banking. They serve their community and state without pay. After a most extensive national survey the Commission framed a plan of action. The eight points in this plan were to sponsor and aid:

1. Community type non-profit blood banks.
2. Banks controlled by the local county medical society.
3. Adequate blood coverage for all at cost.
4. High and uniform standards of service.
5. Coordination and reciprocity between community blood banks.
6. Fast and efficient distribution systems.
7. Assistance to other states and the nation in disaster or war.
8. Research.

The Commission's results over the last year have been encouraging. However, much work remains to be done before that part of the plan calling for adequate blood coverage for all at cost is accomplished.

The Commission's plan envisages a system composed of 14 strategically placed regional blood banks. Some of these blood banks, fortunately, have been operating for years. When the Commission was formed they readily agreed to fall into the coordinated, integrated system. Their support of the larger picture has been of great value. Without their help, loyalty, and sharing of common interests and problems, nothing could have been done.

Fourteen regional blood banks will give adequate blood coverage to the entire state. Seven are now operating. They are:

The *Sonoma* County Blood Bank, situated in Santa Rosa. This bank stands as a monument to an aroused community. It opened its doors in August 1949.

The *Sacramento* County Blood Bank, started in August 1948, has grown swiftly. Its expansion reflects the urgent need for its product in the surrounding community.

The Irwin Memorial Blood Bank of the *San Francisco* County Medical Society was the first community bank in the nation. It has been of great service to the community in peace and in war.

The *Alameda* County Blood Bank, situated in Oakland, began operating in 1944. Its influence on blood banking is nationwide. Blood banking procedures developed by this institution have aided the entire infusion field.

The *San Mateo* Blood Bank, situated in San Mateo, opened its doors in 1942. Its value to the community and to the nation during the war years places it high in service rendered.

In *Fresno* the Valley Blood Bank during the few months since its inception has given invaluable service to Fresno and the surrounding counties.

The *San Diego* Blood Bank, operated by the San Diego County Medical Society, became a unit in the statewide community blood bank system in November 1950.

The recently organized Tri-County Blood Bank, located in *Santa Barbara*, will serve San Luis Obispo, Santa Barbara and Ventura counties.

Bakersfield, Los Angeles, Riverside and San Bernardino counties are expected to join in the community non-profit blood bank system within a year, which would complete the Commission's plan of action and provide blood service coverage for the entire state.*†

A blood bank is comparable to a wheel: The main blood center or regional bank is the hub, and towns fan out along the spokes to the rim. Community blood banks lend themselves most favorably to this ideal plan. The California system of interlocking procurement and distribution areas protects *all* the people. The wheels mesh; the system is flexible; it functions without friction. It protects people in rural areas as well as those in the cities.

Under our plan, each hospital in each town on the "wheel" is allocated a blood quota; that quota is determined by the amount of blood used by that town's hospitals per month. Once or perhaps twice a month, according to the quantity of blood which the smaller town requires, a mobile unit goes out and draws blood from replacement donors. In the majority of instances the donors are relatives or friends of the patients using the service. The total quantity of blood drawn by the mobile unit is credited to that town. All blood drawn is then taken to the regional bank where serology, Rh studies, toxicity tests and type listings are carried out. The regional bank then stocks the satellite hospital icebox with an adequate supply of blood and, at stated intervals, withdraws those bottles of blood which are close to being outdated. These bottles are returned to the regional bank where, if the contents are found satisfactory, they are processed into plasma. In this way physicians of the smaller hospitals which are located along the spokes of the wheel have blood constantly available for their needs. No longer is it even necessary for an out-of-town physician to call the regional blood bank—he has a supply of the right blood in the right spot at the right time. This service is particularly satisfactory in the obstetrical wards. The consensus of obstetrical opinion is that the greatest maternal

*The San Bernardino and Riverside county medical societies have joined forces and their blood bank should be functioning within three months.

†On September 29, 1950, a Blood Bank Reciprocity Agreement was signed by the California Medical Association and the American National Red Cross. This agreement stipulates that: (1) Inter-blood bank exchanges will be settled on a unit for unit basis. (2) There will be an exchange of funds, where necessary to balance accounts for the actual per unit cost of processing blood. (3) Territorial boundaries to be served by each of the banks operating under the two systems will be defined, thus allowing for expansion. Plans for expansion are subject to the approval or request of the local county medical society. (4) American Red Cross volunteers may be provided at the request of any of the participating blood banks.

death rate is due to hemorrhage. Now that blood can be stored in hospitals, there is hope that the maternal death rate will be significantly lowered.

The Blood Bank Commission has stressed control by the local county medical society. The process of blood banking is a medical procedure, a venipuncture is a surgical operation and, according to the laws pertaining to blood banks, a physician must be in charge.

The Blood Bank Commission's plan for the state calls for adequate blood coverage for all *at cost*. It is opposed to the sale of blood for a profit, as it is to visionary plans to dispense blood free of charge with no requirement for donor replacement. Medicine can adequately take care of its own problems; blood banking is one of them.

The heart of a blood bank is its laboratory. This vital core should be staffed with the best personnel obtainable. A basic uniformity of procedure throughout the system is necessary. The plan of operations for laboratories as outlined in the Biologics Act of the California Public Health Service is adequate. The State Department of Public Health and the Blood Bank Commission working together have promulgated rules and regulations which safeguard blood and its derivatives, thereby guaranteeing to the recipient of that blood a highly certified product.

Widely separated community blood banks, in order to function adequately and efficiently over the entire state, must coordinate, integrate, and have reciprocity among themselves. At present the eight community blood banks in California call upon one another for blood. Usually a simple debit and credit system is all that is required. Payment by actual bottle transfer is made on demand. In an emergency or a disaster, or in the event of another war, this coordinated system would be of an inestimable value. The ability to mobilize tremendous stocks of blood from widely scattered community banks is one of the best safeguards for the future. The California network also has established reciprocity with several states and the Territory of Hawaii.

The Blood Bank Commission recently inaugurated a central clearing house for blood banks. This clearing house is temporarily quartered in San Francisco. It may eventually be situated in a more strategic locality. The agency will maintain a daily count of all blood drawn in the community banks. It will know instantly where the rare types are, where blood is approaching the outdated period, and where to suggest that blood be sent to prevent wastage. Mobile units will be loaned to member banks that do not have such apparatus. Commonly used supplies will be bought in large quantities by the central agency and allocated when requested, thereby cutting expenses to all the banks. It is also possible that in the near future processing of blood by highly specialized techniques, which would require a considerable monetary expenditure (such as the irradiation of plasma) may be assigned by the clearing house to one or two blood banks. The completed product could then be returned to the individual banks which function under the interlocking system. A pooling of research problems in order to prevent duplication of effort will be undertaken. The list of mutual advantages available by this system is endless. The end result is a lowering of the cost per unit of blood to the patient.

To have the right type of blood in the right spot at the right time, fast and efficient distribution systems are necessary. With the present arrangement of community blood banks, each is so strategically situated that it can take care of its own area and a large part of the surrounding countryside. The sites chosen were thoroughly studied to be sure that transportation from the regional bank to the far corners of the area it served was feasible. The Highway Patrol, the Coast Guard, Army, Navy, Air Force, and the sheriffs' air squadrons of the state have pledged their help in fast transportation. The established airlines in the past have played a dramatic role on several occasions. Modern methods of refrigeration make it possible to safeguard blood from the time it is taken from the donor until it goes into the recipient's veins, no matter how far that recipient is from the regional blood bank. The state is growing rapidly. The usual avenues of transportation are crowded. The highways around the larger metropolitan areas are jammed over weekends. Speedy transportation by road at these times is practically impossible. Air transportation is being used more and more.

Assistance to neighboring states and to the nation in case of disaster or war has been stressed. With an entire network of community blood banks cooperating, large quantities of blood could be supplied in short order.

Although *research* was placed last on the plan of action, in reality research begins with the inception of any blood bank. New problems are encountered daily, new situations develop, and new thoughts arise which call for immediate action. Research in blood and blood derivatives is practically unexplored. It is almost virgin territory; the possibilities are endless. They are exciting and provocative.

At present the nation is faced with an international tension which has its effect on military personnel and civilians alike. In the care and treatment of injuries resulting from atomic explosions, blood and blood plasma form the keystone. Blood banks must be widely dispersed and adequately prepared to undergo enormous expansion in times of necessity. Above all, the banks must be coordinated and integrated so that in times of real disaster they can bend their full energy to meet the specific problem.

384 Post Street.

In Memoriam

Berejkoff, Konstantine I. Died in San Francisco, November 4, 1950, aged 58. Graduate of Tomsk Medical Institute, Tomsk, R.S.F.S.R., 1916. Licensed in California in 1928. Dr. Berejkoff was a member of the San Francisco County Medical Society, the California Medical Association, and the American Medical Association.

✣

Brisbine, Royal E. Died in Glendale, September 30, 1950, aged 70, of coronary occlusion. Graduate of the State University of Iowa College of Medicine, Iowa City, 1906. Licensed in California in 1937. Dr. Brisbine was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Brunn, Harold. Died in Stockton, October 5, 1950, aged 76, of a coronary. Graduate of the University of Pennsylvania School of Medicine, Philadelphia, 1895. Licensed in California in 1897. Dr. Brunn was a retired member of the San Francisco County Medical Society, the California Medical Association, and an Associate Fellow of the American Medical Association.

✣

Eaton, Chelsea. Died in San Francisco, October 9, 1950, aged 52. Graduate of the University of Louisville School of Medicine, 1926. Licensed in California in 1926. Dr. Eaton was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Gillespie, Paul B. Died in Santa Ana, October 22, 1950, aged 61, after an illness of several months. Graduate of Creighton University School of Medicine, Omaha, 1917. Licensed in California in 1931. Dr. Gillespie was a member of the Orange County Medical Association, the California Medical Association, and the American Medical Association.

✣

Harlin, Robert J. Died October 29, 1950, aged 72. Graduate of the University Medical College of Kansas City, 1903. Licensed in California in 1922. Dr. Harlin was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✣

Jacobs, Francis E. Died in Woodland, October 14, 1950, aged 47, of an acute coronary. Graduate of the University of Oregon Medical School, Portland, 1929. Licensed in California in 1930. Dr. Jacobs was a member of the San Diego County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

Jones, Richard W. Died in Yreka, September 24, 1950, aged 41, of coronary sclerosis with occlusion. Graduate of Jefferson Medical College of Philadelphia, 1935. Licensed in California in 1937. Dr. Jones was a member of the Siskiyou County Medical Society, the California Medical Association, and the American Medical Association.

✣

Kimberlin, Lester O. Died in San Francisco, November 2, 1950, aged 66. Graduate of Cooper Medical College, San Francisco, 1911. Licensed in California in 1911. Dr. Kimberlin was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

Mentzer, Stanley H. Died in San Francisco, October 6, 1950, aged 53, of cerebral vascular accident. Graduate of the University of California Medical School, Berkeley-San Francisco, 1923. Licensed in California in 1923. Dr. Mentzer was a retired member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✣

Mott, Edwin L. Died in Fresno, September 23, 1950, aged 57, in a fire. Graduate of Jefferson Medical College of Philadelphia, 1918. Licensed in California in 1919. Dr. Mott was a retired member of the Fresno County Medical Society, and the California Medical Association.

✣

Nuttall, John P. Died in Los Angeles, October 7, 1950, aged 72, of a heart ailment. Graduate of the Hospital College of Medicine, Louisville, 1902. Licensed in California in 1910. Dr. Nuttall was a retired member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Price, Jerry C. Died in Los Angeles, September 24, 1950, aged 46, of carcinoma. Graduate of Tulane University of Louisiana School of Medicine, New Orleans, 1941. Dr. Price was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Sands, Robert L. Died in Encino, November 6, 1950, aged 54. Graduate of the University of Nebraska College of Medicine, Omaha, 1919. Licensed in California in 1936. Dr. Sands was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✣

Slavich, John F. Died in Oakland, October 21, 1950, aged 69, of uremia. Graduate of the University of California Medical School, Berkeley-San Francisco, 1904. Licensed in California in 1904. Dr. Slavich was a member of the Alameda County Medical Association, the California Medical Association, and the American Medical Association.

✣

Smart, Elliott P. Died in Murphys, October 13, 1950, aged 65, of a cerebral hemorrhage. Graduate of the College of Physicians and Surgeons, Los Angeles, 1912. Licensed in California in 1912. Dr. Smart was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Questions and Answers about C. P. S.

(Editor's Note: *The new C.P.S. contracts are being applied throughout the state to all new groups, and also are being applied gradually to existing groups by conversion of old contracts to new contracts. Thus, while all C.P.S. patients are not as yet affected, an increasing percentage of them will be in ensuing months. To assist C.P.S. physician-members and their office staffs in making this transition, the principal differences between old and new contracts are summarized below.)*

Hospital Contract:

1. *Old*—21 days' hospital care provided for each illness, operation or injury from a separate cause when member is necessarily admitted as a registered bed patient in a licensed hospital. Immediately following, member is entitled to 345 days (180 days for Standard Oil Group and 79 days for Individual Plan) at one-half cost, if he remains continuously registered as a bed patient.

New — Two types of contracts are offered — one providing a maximum of 50 days' hospital care, the other a maximum of 100 days' care. Both apply only when member is necessarily admitted as a registered bed patient in a licensed hospital. If the 50 (or 100) days' hospitalization is exhausted, it is automatically renewed when the member has been out of the hospital for at least 90 days or in the case of an accidental injury requiring hospitalization. The 50 (or 100) days may be used in broken intervals or in one continuous period of hospitalization.

2. *Old*—Hospital care of $50 each year is provided for childbirth, caesarean sections, or for conditions arising from pregnancy, if member has had a two-person-or-more contract during the preceding ten-month period.

New—The $50 provision remains the same, but the ten-month waiting period is changed to nine months.

3. *Old*—Drugs and medications up to $3.50 provided per hospital admission.

New—No provision for drugs and medications.

Surgical Contract:

1. Old—No benefits provided for basal metabolism tests and electrocardiograms.

New—Basal metabolism tests and electrocardiograms provided when member is necessarily confined as a registered bed patient in a licensed hospital and when they are incidental to the illness or injury necessitating hospitalization.

2. *Old*—Provision for x-rays performed by a physician, in his office or in hospital, in fracture or dislocation cases.

New—A total of up to $25 provided each contract year (i.e., the 12-month period commencing with the effective date of the member's enrollment in C.P.S.) for x-rays performed outside the hospital in connection with accidental injury cases, including all fractures and dislocations. This $25 provision is in addition to x-rays necessary to establish diagnosis while member is hospitalized.

Two-Visit-Deductible-Medical Contract:

1. *Old*—Medical benefits begin with the third visit to the doctor for each condition, with the patient paying for the first two visits in each case.

New—In accidental injury cases benefits for non-surgical professional services begin on the first visit. Benefits for illness begin with the third visit, with the patient paying for the first two visits.

2. *Old*—For chronic and recurrent conditions, medical benefits are provided for three consecutive months (from initial date of C.P.S. liability). Medical benefits for other conditions provided for one year.

New—Medical benefits provided for three consecutive months (from initial date of C.P.S. liability) for all ailments, except certain listed ailments for which benefits are provided for one year. Listed ailments are: Cancer and other malignant conditions, tuberculosis, brain tumors, poliomyelitis, severe burns, leukemia, coronary occlusion, Paget's disease, Hodgkin's disease, stroke, brain concussion, subacute bacterial endocarditis and septicemia.

3. *Old*—Provision for complete laboratory tests performed by a physician when necessary for diagnosis of an illness or injury.

New—A total of up to $10 provided each contract year for laboratory services, including allergy tests. Renewable each year.

4. *Old*—Provision for x-rays and x-ray and radium therapy performed by a physician.

New—A total of up to $25 provided each contract year for ambulatory x-rays for all illnesses or non-accidental injuries. This $25 provision is renewable each year. In addition, radiation therapy for malignancies is provided for one year, starting with the third visit.

5. *Old*—Provision for full fee to physician for maternity care—consisting of prenatal, delivery and postnatal care—if delivery occurs after ten consecutive months of service.

New—Up to $50 for maternity provided for female employee member if member's contract has been in effect for nine consecutive months prior to delivery. The $50 maternity benefit is to be applied to the physician's usual charge for such services. No x-ray or laboratory benefits provided for maternity.

Medical-Service-While-Hospitalized Contract:

Old and new benefits for medical-service-while-hospitalized contract remain substantially the same, but additional exclusions are alcoholism, Workmen's Compensation cases and cases where services are provided without cost to member by a governmental agency. Also, if member is already hospitalized on effective date of this coverage, all professional services (including those rendered during the period of hospitalization immediately following) are excluded, unless the member is already entitled to them under his basic coverage.

NEWS and NOTES

NATIONAL • STATE • COUNTY

CALAVERAS-SAN JOAQUIN-TUOLUMNE

A charter was issued last month by the **American Academy of General Practice** to the recently organized San Joaquin - Tuolumne - Calaveras chapter of the organization. Dr. James J. Heffernan is president of the new chapter and Dr. John Blinn, Jr., is secretary.

FRESNO

One hundred twenty-five physicians from San Joaquin Valley areas attended the **Fresno Medical and Surgical Institute,** a seminar program arranged through the California Medical Association Committee on Postgraduate Activities, which was held November 2 and 3. Lecturers for the meeting were members of the staff of the University of California at Los Angeles School of Medicine.

It is planned to hold similar meetings annually hereafter.

* * *

The Committee on Rural Medical Service of the California Medical Association will hold its fourth annual **Rural Health Conference** in Fresno, Saturday, January 13, 1951. Principal subject for discussion will be "Rural Hospital Problems."

LOS ANGELES

Dr. Wilbur Bailey, clinical professor of radiology at the University of Southern California School of Medicine, recently was elected president of the California State Board of Medical Examiners, and **Dr. Joe Zeiler** of Los Angeles was elected vice-president. **Dr. Frederick N. Scatena,** Sacramento, was reelected secretary-treasurer.

RIVERSIDE

The third institute of the 1950-51 series under the direction of the California Medical Association Committee on Postgraduate Activities will be held in Riverside at the Mission Inn, January 25 and 26. The lectures are to be given by members of the staff of the University of Southern California School of Medicine.

The program is as follows:

THURSDAY, JANUARY 25, 1951

8:30-9:30 a.m.—Registration.

10:00-11:00 a.m.—"Cardiology — Use of Anticoagulants in Cardiovascular Diseases" — George C. Griffith, M.D., clinical professor of medicine and medical director, Graduate School of Medicine, University of Southern California.

11:00-12:00 noon—Study groups.

1. "New Concepts in Diagnosis and Therapy in Cardiovascular Diseases"—George C. Griffith, M.D.
2. "New Concepts in Diagnosis and Therapy in Dermatologic Diseases"—Maximilian E. Obermayer, M.D.
3. "New Concepts in Diagnosis and Therapy in Gynecology"—Erle Henricksen, M.D.

12:30-2:00 p.m.—Luncheon round table: "Use of Newer Antibiotics"—George C. Griffith, M.D., Maximilian E. Obermayer, M.D., and Erle Henricksen, M.D.

2:00-3:00 p.m.—"Do's and Don'ts in Dermatology"—Maximilian E. Obermayer, M.D., clinical professor of medicine, head of dermatology and syphilology, School of Medicine, University of Southern California.

3:00-4:00 p.m.—Study groups continued.

4:00-5:00 p.m.—Lecture: "Office Procedures in Gynecology" —Erle Henricksen, M.D., associate clinical professor of obstetrics and gynecology, School of Medicine, University of Southern California.

6:30 p.m.—Dinner meeting: "Treatment of Edema"—George C. Griffith, M.D.

FRIDAY, JANUARY 26, 1951

9:00-11:00 a.m.—Demonstration and Ward Rounds, Riverside County General Hospital.

1. Surgical Demonstration—C. J. Berne, M.D.
2. Orthopedic Ward Rounds — Francis McKeever, M.D.
3. Internal Medicine Rounds—Paul Starr, M.D.

11:30-12:30 p.m.—"Orthopedics" (dealing with low back pain and treatment of traumatic injuries of the extremities)—Francis McKeever, M.D., assistant clinical professor of surgery, School of Medicine, University of Southern California.

12:30-2:00 p.m.—Luncheon round table: "Treatment of Thyroid Disease"—Paul Starr, M.D., and C. J. Berne, M.D.

2:00-3:00 p.m.—"Clinical Effects of ACTH and Cortisone" —Paul Starr, M.D., professor of medicine (head), School of Medicine, University of Southern California.

3:00-4:00 p.m.—"Management of Perforated Appendicitis" —C. J. Berne, M.D., clinical professor of surgery (head), School of Medicine, University of Southern California.

4:00-5:00 p.m. — Clinical-Pathological Conference — Cecil Bassinger, M.D., C. J. Berne, M.D., and Paul Starr, M.D.

SAN FRANCISCO

A blood vessel bank to collect and store fresh blood vessels so that surgeons in the San Francisco Bay Area may have them available for grafting purposes has been established in the department of thoracic surgery, University of California School of Medicine.

The financing of the new bank is made possible by funds derived from the $100,000 endowment presented to the University in 1928 by Mr. and Mrs. George Roos of San Francisco for the establishment of the J. J. and Nettie Mack Clinic.

SANTA BARBARA

There were 119 paid registrants at the first annual **Santa Barbara Medical and Surgical Institute,** held at Bissell Auditorium, Cottage Hospital, October 12 and 13. In addition, courtesy memberships were extended to 25 interns and residents. A regional meeting to serve the counties of Ventura, Santa Barbara, San Luis Obispo, Monterey, San Benito and Santa Cruz, the institute was arranged through the California Medical Association Committee on Postgraduate Activities. Program arrangements were made by Dr. H. M. Walton, chairman of the Committee on Graduate and Postgraduate Medical Education, College of Medical Evangelists.

POSTGRADUATE EDUCATION NOTICES

For more complete information as to fees and time of sessions address the institutions as listed.

UNIVERSITY OF SOUTHERN CALIFORNIA SCHOOL OF MEDICINE

CARDIOLOGY—12 weekly two-hour evening lectures on all aspects of heart and peripheral vascular diseases, with special emphasis on the evaluation of cardiac drugs and the practical interpretation of x-rays of the heart and electrocardiograms. Inglewood, January 18, 1951.

ENDOCRINOLOGY—12 weekly two-hour evening lectures and demonstrations on the clinical characteristics of the endocrine syndromes, their pathology, physiology, diagnosis and treatment. San Diego, January 19, 1951.

UNIVERSITY OF CALIFORNIA MEDICAL EXTENSION, San Francisco 22

Graduate Instruction:

February 5 to April 9, 1951 (Monday evenings).

Clinical Science as applied to General Medicine, Part III, Gastroenterology.

September through January (Monday and Wednesday evenings).

Didactic Resident Course in Ophthalmology. Part I, First Semester.

(A few places are available in each of the above for practicing physicians.)

Postgraduate Courses for Practicing Physicians:

January 23 to 26 (at Franklin Hospital).

Urology in Practice. Lectures and demonstrations on newer methods.

January 29 to February 2 (mornings at Medical Center).

Cardiovascular Diseases. Recent advances in diagnosis and treatment.

Electrocardiology (afternoons at Medical Center). One hour lecture and two hours of practice in interpretation.

February 19 to 23 (University Extension Building, 540 Powell Street).

Diseases of Chest. Recent advances and evaluation of fundamental diagnostic and therapeutic problems.

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

Internal Medicine—9 months full-time, December 4, 1950 to September 1951.

Trauma, Fractures, and Reconstructive Surgery—December 7, 1950 to April 1951. One per week.

Institute on Upper Extremity Prosthetics, January 22 to 26, 1951.

Advanced Hematology—January 10 through February 28, 1951. One night a week for eight weeks.

THE COLLEGE OF MEDICAL EVANGELISTS

Differential Diagnosis and Treatment of Internal Diseases—January 8 through March 26, 1951.

Dermatology—January 3 through March 21, 1951.

General Urology—January 3 through February 28, 1951.

Proctology—January 4 through March 8, 1951.

Cardiology—January 9 through March 13, 1951.

Ophthalmology — January 30 through March 20, 1951.

Histology and Histopathology of the Eye—February 28 through June 20, 1951.

Varicose Veins—March 1 to April 5, 1951.

GENERAL

Four California physicians, two from San Francisco and two from Los Angeles, were appointed recently to positions on the **national advisory councils** of the U. S. Public Health Service. Dr. Lowell S. Goin, chief of the department of radiology at Queen of Angels Hospital, Los Angeles, was appointed to the cancer council, and Dr. Burrell O. Raulston, dean of the Medical School of the University of Southern California, was named to the heart council. Dr. Wilton Halverson, California State Public Health Director, and Dr. Karl F. Meyer, professor of experimental pathology, University of California School of Medicine, were appointed to the health council.

* * *

Almost 1,000 physicians are reported to have attended the second annual scientific assembly of the **California Academy of General Practice** which was held last month in Sacramento.

Dr. Dave F. Dozier of Sacramento was installed as president of the organization, Dr. Clifford Burwell of Los Angeles was named speaker of the congress of delegates and Dr. Elmer Hof, Fresno, vice-speaker. Elected as delegates to the convention of the American Academy of General Practice which is to be held in San Francisco in March were Doctors John G. Walsh of Sacramento and Frederick Ewens of Manhattan Beach, retiring president. Dr. Carroll Andrews of Sonoma and Dr. Dozier will serve as alternates.

Members selected for the board of directors were Doctors Andrews, Richard Sheretz of Sunnyvale, James L. Dennis of Merced, Clarence T. Halburg of Redlands, James J. Heffernan of Stockton, William G. Burkhard of San Francisco, Marlin L. Newkirk of South Gate, Charles A. Preuss of Santa Barbara, James C. Raphael of Oakland, James E. Reeves of San Diego, John Rovane of Sacramento, William T. Zimmerman of Los Angeles and John G. Walsh, editor of the California Academy's monthly publication.

Out-of-state guest speakers at the scientific assembly were Dr. Walter Alvarez of the Mayo Clinic and Dr. Philip Thorek of Chicago.

* * *

Grants totaling $217,534 have been awarded to four California medical schools by the National Institute of Mental Health as an aid to expansion of teaching programs to train psychiatrists, medical students, psychologists, nurses and social workers.

The University of California was allotted $129,328, Stan-

ford University $33,160, the University of Southern California $42,470, and the University of California at Los Angeles $12,576.

* * *

In the interest of uniformity in the **classification of carcinoma of the uterine cervix**, the International Congress on Obstetrics and Gynecology has called attention to the following resolution which was passed at a meeting of a committee of the International and Fourth American Congress on Obstetrics and Gynecology last May:

Whereas the so-called League of Nations' Classification of Carcinoma of the Uterine Cervix is now in common use in many countries but is not used exclusively in the United States of America, it is desirable that this classification, or an acceptable modification thereof, be adopted universally in order to reach a common ground of understanding. Therefore, a committee of duly appointed representatives of the

Section of Obstetrics and Gynecology of the American Medical Association, the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons, and the American Gynecological Society,

meeting in session with the *Editorial Committee of the Annual Report on the Results of Radiotherapy in Carcinoma of the Uterine Cervix* on the occasion of the International and Fourth American Congress on Obstetrics and Gynecology at New York City on May 14-19, 1950, has agreed to propose the following modification of the classification adopted by the Health Organization of the League of Nations in 1937:

Stage O—Carcinoma *in situ*—also known as preinvasive carcinoma, intra-epithelial carcinoma and similar conditions.

Stage I—The carcinoma is strictly confined to the cervix.

Stage II—The carcinoma extends beyond the cervix, but has not reached the pelvic wall. The carcinoma involves the vagina, but not the lower third.

Stage III—The carcinoma has reached the pelvic wall. (On rectal examination no "cancer-free" space is found between the tumor and the pelvic wall.)
The carcinoma involves the lower third of the vagina.

Stage IV—The carcinoma involves the bladder or the rectum, or both, or has extended beyond the limits previously described.

Be It Resolved, That this Classification be termed the International Classification of the Stages of Carcinoma of the Uterine Cervix, and that all organizations concerned with the problem on hand be approached to consider its adoption.

COMMITTEE

(Section of Obstetrics and Gynecology, American Medical Association):

Roy Calkins, M.D.
Walter Dannreuther, M.D.
William Mengert, M.D.

(American Gynecological Society):

Herbert Schmitz, M.D.
Ludwig Emge, M.D.
William P. Healy, M.D.

(American Association of Obstetricians, Gynecologists, and Abdominal Surgeons):

Bayard Carter, M.D.
Robert Faulkner, M.D.
James Corscaden, M.D.

(Editorial Committee, Annual Report of Results of Radiotherapy in Carcinoma of the Uterine Cervix):

James Heyman, M.D.
Malcolm Donaldson, M.D.
Joe V. Meigs, M.D.

BOOK REVIEWS

A TEXTBOOK OF GYNECOLOGY. By Arthur Hale Curtis, M.D., Emeritus Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School; and John William Huffman, M.D., Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School. Sixth Edition—466 Illustrations. W. B. Saunders Co., Philadelphia, 1950. $10.00.

In preparing the sixth edition of this well-known text Curtis has shared the labors of revision with John W. Huffman, known for his contributions to the embryology of the genito-urinary tract. Curtis states in the introduction to the present edition that he had thought it advisable to divide the responsibility of revising the text in collaboration with a junior author actively engaged in teaching since he no longer participates in university duties. This is a farsighted move for it holds out a reasonable assurance for the perpetuation of a valuable textbook.

Curtis' Gynecology is an old standby for medical students and a handy guide for the busy practitioner and, as such, needs no detailed review. On the whole it is practical in its conception, it is readable and reliably documented. The present edition has been enriched with additional information about the embryology of the genito-urinary tract and some of the commoner disturbances of the vesicorenal system. Minor changes appear in many chapters. The chapters on anatomy, embryology and physiology are outstanding and beautifully illustrated by Tom Jones.

As far as diagnosis and treatment are concerned there might be room for further revision. Certain attitudes are strictly those of the senior author whose long experience in the practice and teaching of gynecology has made him rather set in his views. In some respects this enhances the value of the text because it allows teachers to take exception and therewith create discussion. However, a broader approach would be more enlightening to the student who then could acquaint himself with methods of treatment other than those advocated by the senior author. This is true in particular of the chapters dealing with the rapidly expanding field of endocrinology, with the study and treatment of dysmenorrhea and the etiology of cancer. There is room also for a broader discussion of psychosomatic phenomena particularly as this relates to the menarche, menopause, dysmenorrhea and the host of poorly understood pelvic complaints, not to forget the approach to the handling of cancer patients. Yet, all in all, none of these minor shortcomings detracts from the widely recognized value of this book as a teaching text and a practitioner's guide.

Curtis' Gynecology is illustrated elaborately, in fact, one might say, almost extravagantly. For instance, the mass of illustrations depicting a variety of surgical corrections of a rather limited field of traumatic disturbances is a fine example of the versatility of approach to a surgical problem but it must be bewildering to the young student to see such an array of surgical technique without finding adequate explanations in the text to permit him to understand why so many different procedures have been devised. This needs correction either through elimination of some of the less useful methods depicted or by offering a more adequate discussion of their respective applications. Your reviewer has watched the growth of this textbook since its first appearance and he has noticed that with each edition there is a growing tendency to develop it into a more elaborate handbook of the reference type. He hopes this will not come to pass because handbooks are not handy texts for students. Besides, frequent revisions are out of the question because of the cost, the limited market and the monumental effort required to keep abreast with the progress of medicine. The three volumes of Gynecology edited by Arthur Curtis years ago are a good example of the fate of inflexible handbooks.

W. B. Saunders Company is known for its high standard in publishing medical texts. The sixth edition of Curtis' Textbook of Gynecology attests in every respect to the continuance of this enviable record. In view of the fine printing, the clear illustrations. high grade paper and good binding the cost of the book at $10.00 seems not out of line although students are finding it increasingly difficult to acquire textbooks at the present high prices.

* * *

ANGINA PECTORIS AND MYOCARDIAL INFARCTION—With Special Reference to the Autonomic Nervous System. By Heymen R. Miller, M.D., Formerly Principal Physician and Chief, Signal Corps Climatic Research; Attending Physician, Sydenham Hospital. Grune & Stratton, New York, 1950. $8.75.

This book presents a detailed discussion of the anatomy of the autonomic pathways of the heart and their role in the distribution of cardiac pain in coronary disease and myocardial infarction. In addition, considerable information on the physiology of the autonomic nervous system and its relation to the circulation is presented. In this respect the book is valuable as a reference for those who wish unusually detailed information on these matters.

The remainder of the book considers the clinical aspects of the subject, including the electrocardiographic findings, and the medical and surgical aspects of treatment. In the reviewer's opinion a large part of this material is considerably below the standard of other parts of the book, and in some instances greatly detracts from its value as a text. The section on the electrocardiogram is entirely inadequate and adds little of value to the book. It is inferred that there are distinguishable differences between the electrocardiogram of myocardial infarction with coronary occlusion and that of myocardial infarction without coronary occlusion. and illustrative tracings are presented as examples which differ only in the degree of electrocardiographic abnormality. In the reviewer's opinion such differentiation is unsound and not based on generally accepted principles of electrocardiography. The electrocardiogram illustrating acute pulmonary embolism is described as showing a Q wave in lead III when the initial deflection of the ventricular complex in this lead is positive. In no instance is more than one precordial lead included with the electrocardiographic illustrations, and in only one instance was the site of the indifferent electrode noted.

The section on the clinical features of myocardial infarction is confused by the author's preoccupation with the clinical differentiation between myocardial infarction "with and without coronary occlusion"; and the illustrative cases presented offer the reader no reasonable basis for such a differentiation.

The section on treatment is adequate, though it suffers from the use of proprietary names for suggested drugs, ten of which were recommended as hypnotics.

This book cannot be recommended for medical students. and will have limited use as a reference text by physicians interested in heart disease.

MEDICAL PARASITOLOGY—For Medical Students and Practicing Physicians. By William G. Sawitz, M.D., Associate Professor of Parasitology, Associate in Medicine, The Jefferson Medical College of Philadelphia. The Blakiston Company, Philadelphia, 1950. $4.25.

There seems little reason for another text on medical parasitology unless it has unique features that make it of more value than books already available. Such is the case with Sawitz' new volume of 296 pages including a usable index. The author is abundantly qualified by experience and judgment for such a task. He aims at a fairly restricted and specific field in his introduction. He says, "This manual is intended as a Lecture and Laboratory Guide for students in their course in Medical Parasitology. It does not, and is not intended to, replace text books which are essential for parasitologists. Medical schools, however, do not train parasitologists." How true and how often forgotten! He continues, "It is the aim of this manual to present the subject from the medical rather than from the zoological point of view to present the information necessary for the understanding of parasitic diseases."

It is refreshing to have an up-to-date new book of such a nature and of definitive use to newer and especially younger medical practitioners. The contents include the usual human parasitic protozoa, worms and arthropods, a short section on collection of material, a condensed Chapter 5 (p. 205) on treatment, and a useful vocabulary.

This little volume is well-printed, lies flat and stays open and will be of definite use to many laboratory technicians and all physicians in general practice, internal medicine or diagnosis, besides medical students.

* * *

PHYSICIAN'S HANDBOOK. By Marcus A. Krupp, M.D., Assistant Clinical Professor of Medicine, Stanford University School of Medicine; Director, Clinical Pathology, VA Hospital, San Francisco; Norman J. Sweet, M.D., Assistant Professor of Medicine, U. C. School of Medicine; Ernest Jawetz, M.D., Associate Professor of Bacteriology and Lecturer in Medicine and Pediatrics, U. C. School of Medicine; and Charles D. Armstrong, M.D., Clinical Instructor in Medicine, Stanford University School of Medicine. Sixth Edition. University Medical Publishers, Post Office Box 761, Palo Alto, Calif. 1950. $2.50.

The sixth edition of this popular handbook has been completely revised in format and content. The four new authors have been successful in condensing a great amount of factual material without sacrificing accuracy and readability. Recent advances in diagnostic methods and therapy have been included and new sections relating to electrocardiography, electroencephalography and radioisotopes have been added.

The sections on electrocardiography and electrolyte balance are outstanding for straightforward presentations of difficult subjects and will be of great value to those needing concise information in these fields. However, all sections in this new edition reveal the painstaking efforts of the authors and it is perhaps unfair to single out particular sections for commendation. The sections dealing with specific phases of laboratory diagnosis contain information on a great number of diagnostic procedures which are usually found only in the larger volumes on this subject.

The illustrations are excellent and the offset printing is attractive and easy to read. The new rapid index combined with a practical grouping of material enables the reader to find what he wants in a minimum of time.

Although some readers may take issue with a few statements found in various sections, it is the opinion of the reviewer that a handbook to be of value must be didactic. If the reader desires a more complete evaluation of certain disputed points he should use other source material.

This volume is outstanding in its field and will prove of value to students, graduate trainees, general physicians and specialists.

THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA (THE U. S. PHARMACOPEIA). Fourteenth Revision (U.S.P. XIV) and the First U.S.P. XIV Supplement—Mack Publishing Company, Easton, Pa., 1950. $9.00.

The current edition of the Pharmacopeia contains more than 200 additional drugs with less than 100 deletions. The antibiotics, antiparasitic agents, ephedrine substitutes, analgetics, and many other new products now are given public, unprotected U.S.P. titles and descriptions.

The pharmacopeia is chiefly of interest to pharmacists for specifications, and assay and analytical procedures. To the physician, its chief use is as a source of essentially noncommercial products.

* * *

STREPTOMYCIN. Edited by Selman A. Waksman, Ph.D., New Jersey Agricultural Experiment Station, Rutgers University. The Williams and Wilkins Co., Baltimore, 1949. $10.00.

This book presents the microbiologic, pharmacologic and clinical properties of streptomycin as summarized by authorities in various fields. Considerable information has been assembled by authors who were well chosen for their close association with investigational and practical endeavors in this field. Each author develops his topic in one of the 46 chapters and gives references to the pertinent literature listed in a bibliography appearing at the end of each chapter. The chapters vary considerably in scope and skill of presentation and unfortunately the writers repeat numerous references and needlessly duplicate much background material. A single bibliography and more liberal blue pencil might well have avoided this defect.

Taken topic by topic a handy reference source is provided both as to data and cross-reference to salient literature. Used in this manner the arrangement and index seem adequate. However, when read in toto, the reader is bogged down by many statements of bacterial sensitivity, action and nomenclature. A second impasse is reached wading through almost interminable disease entities whose course has been altered by the advent of streptomycin. This is perhaps a tribute to the wide applicability of the antibiotic. Approached individually, chapters devoted to these subjects provide much authoritative detail. The first few chapters give an interesting historical picture of the impressive phase of the development of streptomycin.

To the student of bacteriology and medicine concerned with bacterial disease and especially with the management of tuberculosis, close acquaintance with streptomycin is mandatory. This volume provides the background for intelligent utilization of this potent agent. Availability of a composite volume of this type should serve many physicians, bacteriologists and chemists as a reference source.

* * *

PROGRESS IN NEUROLOGY AND PSYCHIATRY—An Annual Review, Volume V. Edited by E. A. Spiegel, M.D., Professor and Head of the Department of Experimental Neurology, Temple University School of Medicine, Philadelphia. Grune & Stratton, New York, 1950. $10.00.

This excellent review is the last of a series which has established itself as consistently excellent in its field. It is obviously aimed at the level of the specialist in neurology and psychiatry, but the greater portion of the volume would be of definite value to the general practitioner of medicine as well. The book is divided into three sections. Something over 100 pages are devoted to the basic sciences, 300 to neurology, and 200 to psychiatry. Perusal of the latter two sections should bring one up to date in these two specialties which form such a large part of the everyday practice of medicine. Equally, it may help to dispel the prevalent misconception that neurologists are interested only in the diagnosis of obscure clinical entities to the exclusion of the therapeutic approach.

EYES AND INDUSTRY—Formerly Industrial Ophthalmology. By Hedwig S. Kuhn, M.D., Industrial Ophthalmologist, Hammond, Indiana. With 151 Text Illustrations including 3 Color Plates. Second Edition. The C. V. Mosby Company, St. Louis, 1950. $8.50.

With industrial ophthalmology becoming a very important part of our industrial life, a book of this type is very worthwhile.

The author is one of the pioneers in this field and her views will be well received. The book is divided into 11 chapters and 378 pages. The context is similar to the first edition with improvements and additions. The practical observations of the needs of workers doing specific jobs is clearly explained. The method of analysis of such a job case is particularly lucid.

The safety program including goggle types is very well done. The treatment of industrial injuries is essentially unchanged.

The book stresses preventative ophthalmology, visual correction and visual skill testing in a concise and simple manner and is recommended for all ophthalmologists.

* * *

SEX WITHOUT FEAR. By S. A. Lewin, M.D., and John Gilmore, Ph.D. Lear Publishers, Inc., 105 East 15th St., New York, N. Y., 1950. $3.00.

This small volume is intended as a guide to those about to be married. It presents the anatomical and physiological aspects of procreation in a clear and understandable manner, and can be heartily recommended on that score. The illustrations are well done and fulfill their mission. Just what the virtue of the small line drawings accompanying the text may be escapes the reviewer, but they may be decorative.

To what degree the subject lends itself to frank discussion by the prospective marital partners, as advocated by the authors, it is hard to say. Perhaps this varies with the background of the individual, but I am sure there are still some of us old-fashioned enough to feel that a little of the veil of illusion may not be amiss in this department.

It is certain that the authors will fall afoul of the psychoanalysts with their opinion, set forth dogmatically, that a vaginal orgasm is not a necessary part of the sexual act. Who is in the right is a question that will probably never be settled.

The book is far superior to most "bride's manuals," and can be safely placed in the hands of any reasonably literate adult.

* * *

CYTOLOGIC DIAGNOSIS OF LUNG CANCER. By Seymour Farber, M.D., Milton Rosenthal, M.D., Edwin F. Alston, M.D., Mortimer A. Benioff, M.D., and Allen K. McGrath, Jr., M.D., from the University of California Medical Service and the Department of Pathology, San Francisco Hospital and the San Francisco Department of Public Health. Charles C. Thomas, Publisher, Springfield, Illinois. 1950. $6.00.

The authors of this 60-page monograph, which includes 60 colored photographs, have in 11 chapters summarized very well the clinical and cytologic diagnosis of bronchogenic carcinoma. The greater part of the book is used for the discussion of the preparation of smears from sputum and bronchial secretions, and in the details of the malignant and other cells to be found in such smears. This part of the book should serve as a very useful text for those laboratorians who conduct such examinations, and at the same time it should be of interest to clinicians submitting specimens, in order that they may learn the necessity of examination of fresh material, and some of the problems involved in making a cytologic diagnosis.

The final chapters in the book discuss the clinical material and the reliability of the smear examination, and these portions should interest the internists and thoracic surgeons. The results were obtained on 1,254 cases studied by cytologic technique, and clinically observed over a long period of time.

The colored plates are fairly satisfactory, and the discussion throughout the book is concise. The authors in the last paragraph reiterate the warning of others—that long experience is necessary for cytologic examination to be reliable: and they urge that utmost caution be used until positive diagnoses are justified by the experience of the examiner.

* * *

UROLOGICAL SURGERY. By Austin Ingram Dodson, M.D., F.A.C.S., Professor of Urology, Medical College of Virginia, Urologist to the Hospital Division, Medical College of Virginia. With contributions by twelve others. Second Edition. 645 Illustrations. The C. V. Mosby Company, St. Louis, 1950. $13.50.

This successful text has been improved by revision. All the more frequently employed urologic operations are described and a high proportion of them are illustrated by suitably diagrammatic drawings. The selection of techniques has been a personal one, so that certain rather widely used procedures (such as the intubated ureterostomy of Davis and the newer open uretero-enterostomies of Nesbit, Cordonnier, and Hinman, Jr.) have been less fully described. As in the previous edition, perhaps too much space has been devoted to description of the disease process, space which might better be used in more detailed step-by-step description of the operation. However, this, the only book of its kind now in print, is one the full-time and occasional urologist should own.

* * *

TECHNIQUES IN BRITISH SURGERY. Edited by Rodney Maingot, F.R.C.S. Illustrated. W. B. Saunders, Philadelphia. 1950. $15.00.

This first edition is edited by Rodney Maingot, surgeon to the Royal Free Hospital, London. It is composed of a series of articles on special subjects. Twenty-nine eminent British surgeons have collaborated in it. They have not attempted to cover contemporary British surgery; instead, they describe certain operations and techniques favored by them.

The volume is divided into four parts and has 32 chapters. The section on neck operations includes only the thyroid gland, and the abdominal section does not describe any operations upon the biliary system except for ampullary carcinoma. Numerous illustrations, diagrams, and roentgenograms are used to illuminate the text, with special emphasis on technique. The part devoted to the thorax is very well done, and contains chapters by such well known men as Keynes, Sellors, and Price Thomas. Boyd has done an excellent chapter on senile and diabetic gangrene.

It is a difficult book to evaluate since it is not broad enough in scope to be useful for the general surgeon, nor is it specialized enough to satisfy the specialist. All surgeons, however, will find much to interest them.

* * *

ELEMENTS OF MEDICAL MYCOLOGY. By Jacob Hyams Swartz, M.D., Assistant Professor of Dermatology, Harvard Medical School and Postgraduate School. Second Edition. Grune & Stratton, New York, 1949. $5.50.

The attributes of this book are its clarity and simplicity. It will be of use to those who want a thumbnail sketch of medical mycology with special attention to the dermatophytes. The book is quite sketchy, especially with the "deep mycoses," like coccidioidomycosis, and most California physicians would learn little from those sections. For those who are beginning in the field, this book would be helpful, especially if they were focusing attention on the dermatophytes.

TUBERCULOSIS SUPPLEMENT

Presented by

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and

California Trudeau Society

In cooperation with

CALIFORNIA MEDICAL ASSOCIATION

Through its Official Journal

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Printed and Edited under the direction of

Edward W. Hayes, M.D. . . . . President, California Tuberculosis and Health Association

R. A. Schneiders, M.D. . . . . President, California Trudeau Society

Chesley Bush, M.D. . . . . General Chairman, 1950 Annual Meeting Program Committee

Dwight L. Wilbur, M.D. . . . . Editor, California Medicine

FOREWORD: AN EXPRESSION OF APPRECIATION

The California Tuberculosis Associations are deeply appreciative of the courtesy extended by the California Medical Association in making it possible to present the papers read before the 1950 annual meeting of the California Tuberculosis and Health Association and the California Trudeau Society. It is hoped that this presentation will be of interest to general practitioners.

The California Tuberculosis Associations are anxious to continue the close and pleasant association which they have always had with the medical profession of the state, to the end that all our communities may approach the ideal level of community health.

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X-Ray Survey Results and Costs—A Health Officer's Viewpoint

A Preliminary Report

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SUMMARY

The obvious results of a mass chest x-ray survey from a health officer's viewpoint are:

1. The early discovery of unknown cases of pathologic conditions of the chest—tuberculosis, neoplasms, heart abnormalities.

2. Increase in the community's awareness of its tuberculosis problem.

3. Opportunity to work closely with the medical society and the individual private physicians.

4. Stimulation of all agencies in a community, health and non-health, to work together on a health project for the good of all of the people.

5. Increased cooperation between the local department of public health and other health agencies in a community.

6. Opportunity to underline to a staff of a local department of public health the importance of thinking in terms of the department as a whole, rather than in terms of respective divisions or bureaus.

7. Opportunity to focus the awareness of the community on its public health services.

In relation to costs, there are three aspects from a health officer's viewpoint:

1. The planning, together with other agencies, of an adequate budget with full recognition of community resources.

2. The planning for estimated expansion of tuberculosis control services both in terms of increased expense for maintenance and operation, and of assignment of personnel to survey staff with resulting curtailment or postponement of other programs.

3. The planning for completion of the follow-up program of the x-ray survey and of future continued extension of the total tuberculosis control program as the result of increased community awareness of the tuberculosis problem.

ONE of the objectives of a mass chest x-ray survey is to x-ray as many persons as possible of the eligible population. During the San Diego metropolitan mass chest x-ray survey, 81.7 per cent of the eligible population, 245,061 persons, 15 years of age and over, were x-rayed. The total of 245,061 small x-rays includes 4,588 miniature films taken by the tuberculosis clinic and 888 miniature films taken by the medical services of the 11th Naval District, during the survey period and directly related to the total survey program.

Concomitant with the total take as one of the results of the survey are the preliminary findings as shown by a progress report of the reading of small and confirmatory films taken from December 13, 1949, to February 17, 1950.

Small Films Read at Survey Headquarters

A small film reading is not a diagnosis; it is only the impression of a physician, based on a single miniature.

X-ray film:	Number	Per Cent
Total small films read	239,585	
Essentially negative findings	230,010	96.4
Abnormal findings	8,547	3.6

Director of Public Health, San Diego City-County Department of Public Health.

Presented at the annual meeting of the California Tuberculosis and Health Association and the California Trudeau Society, March 30-April 1, 1950, San Diego.

Confirmatory Film Readings

A confirmatory film reading does not in itself constitute a diagnosis.

	No.	%	%	%
Essentially negative findings	1,417	19.7	....	....
Total abnormal findings	5,791	80.3	100.0	....
a. Abnormal findings (not significant for follow-up)	1,995	....	34.5	....
b. Evidence of tuberculosis	1,782	....	30.8	....
1. Reinfection type	1,623	....	....	100.0
(a) Minimal	1,034	....	....	63.7
(b) Moderately advanced	459	....	....	28.3
(c) Far advanced	130	....	....	8.0
2. Other tuberculosis	114	....	....	....
3. Suspected tuberculosis	45	....	....	....
c. Cardiovascular abnormality	1,117	....	19.3	....
d. Other pathologic changes in chest	657	....	11.3	....
e. Neoplasm	240	....	4.1	....

Number with Suspicious Findings on Confirmatory Film

	Number	Per Cent
A. Total suspicious findings	5,791	100.0
Referrals:		
1. Referred to private physician, clinics, etc.	3,089	53.3
2. Referred to tuberculosis clinic	627	10.8
3. Referred to San Diego County General Hospital	80	1.4
Not significant for referral	1,995	34.5

In discussion of the case register data, it should be pointed out that the present tuberculosis case-finding program of the San Diego City-County department of public health has been in effect only two years. Also, the population is still increasing at

an abnormal rate, which means new cases discovered among newcomers to the community—some of which may have been previously reported elsewhere.

Approximately 10 per cent of the number of persons with findings suspicious of tuberculosis were previously registered with the health department as having tuberculosis.

All of the results of an x-ray survey mentioned are tremendously important in terms of the prevention of needless suffering and untimely loss of life as well as in the saving of both private and public funds. However, there are other results from a health officer's viewpoint of which one becomes aware only through the actual experience of a mass x-ray survey.

A mass chest x-ray survey presents the local department of public health with an opportunity to increase the community's awareness of its tuberculosis problem. A survey program means an impact of publicity far beyond the ordinary scope of a local department of public health. For example, 700,000 envelope stuffers (small single sheets) were mailed with water bills, gas bills, bank statements, etc. Outdoor advertising was posted on billboards which were passed by 413,000 motorists every day from December 1, 1949, to January 31, 1950. School children carried home 52,000 copies of a "Message to Parents," a brief pamphlet explaining the value of a chest x-ray in tuberculosis control, the need to x-ray all adults.

The survey presents a local department of public health with an opportunity to work closely with the medical society and the individual private physicians. Individual remarks by physicians and public health personnel have clearly indicated that one of the results of the survey is the increased understanding of each other's problems by public health personnel and private physicians, as well as mutual recognition of shared objectives in protecting the health of the people.

There are many opportunities to work with the medical society during a survey. For instance, the local medical society must make the request for, and agree to participate actively in, the mass x-ray survey before the initial request can be forwarded to the United States Public Health Service. This means determining together the pros and cons of such a survey. Together, the private physicians and public health personnel work out professional standards, criteria, and procedures, even including the technical accuracy and wording of educational material, news releases, and other publicity materials. At survey headquarters, after a busy day at their offices, private physicians work on review boards, reading x-rays, determining when referral for diagnostic procedures is necessary, and carrying out other attendant professional functions. As the survey moves on, contacts of the local department of public health with private physicians mount daily as referrals are made concerning suspicious findings and will continue in the future in the subsequent follow-up as the physicians report to the department of public health the final diagnosis in referred cases.

An x-ray survey presents an opportunity for all agencies, official and voluntary, health and otherwise, to work together on a common project. For example, labor, coordinating councils and religious groups each played an important role in the success of the survey. In the process of working together, all agencies come to understand better each other's problems and services. Health agencies frequently work together on coordinated programs and joint projects, but it is rarely that all agencies in a community work on a health project. In San Diego, 139 key organizations appointed representatives who served on the board of directors.

Hand in hand with those results goes the one of increased cooperation between the local department of public health and the other health agencies in the community—a real cooperation, not a fine-sounding paper agreement—that comes only from working together to solve a common problem. The partnership begins at least a year before the actual x-raying, as the medical society, local health department, tuberculosis association, and other health agencies study the problems of a survey, from the making of the budget to the rehabilitation of patients with discovered cases of tuberculosis. This very real cooperation increases as the survey time nears, reaching its peak perhaps when assignment is made by various agencies to survey staff of clerical personnel, public health educators, nurses, and physicians. The problem of follow-up of the survey findings brings about a complete coordination of home visits to tuberculosis patients by public health nurses of the official and voluntary agencies.

From a more personal angle, a program of the scope and tempo of a mass chest x-ray survey underlines to the staff of the local department of public health the importance of looking beyond the bureau or division horizon to think of the department of public health as a whole. Staff meetings are held to consider ways and means of securing the basic data and, as the survey grows, of solving the problems presented. Current, routine programs have to be reevaluated in order to set priorities on the staff personnel needed for the x-ray survey. Then, there is the human element of plain pride in being associated with a department that has a role in a project about which everyone is talking, and in sharing in the success of such a program.

Again, from the personal viewpoint as a health officer, a survey sharpens the awareness of the community as a whole to the existence of its department of public health, and particularly the services in tuberculosis control, public health education, public health nursing, public health laboratory, and statistics and records. The all-out publicity again is a factor. And perhaps even more of a factor is the participation in the survey of approximately 15,000 volunteers from every walk of life, each of whom has a job to do during the survey. Then, too, the actual process of having the x-ray means that thousands of citizens identify themselves with the department of public health, perhaps for the first time.

Results do not occur without costs, and, as with results, some costs of a mass x-ray survey are more obvious than others. From the dollars and cents viewpoint:

Appropriations and sources:	
City of San Diego	$ 10,000
County of San Diego	10,000
San Diego Tuberculosis & Health Association	15,000
Five local communities in metropolitan area	2,200
Total cash appropriated	$ 37,200
U. S. Public Health Service:	
Loan of equipment, personnel, film, etc., approximately	$110,000
California State Department of Public Health:	
Loan of personnel in a consultant capacity, and cardiac and neoplasm follow-up program, approximately	$ 17,500
Scientific study of statistical findings, approximately	$ 10,000

When the doors of the headquarters of the San Diego metropolitan mass chest x-ray survey are finally closed, it is expected that the appropriated funds of $37,200 will be expended except for a moderate balance. From this balance the final report will have to be published. Superficially, it would seem that the general budget was adequate. However, mass chest x-ray survey budgeting is in many ways paradoxical. Without the generosity of the community in terms of goods and services, the $37,-200 budget in San Diego would have been inadequate to carry out the job of x-raying 81.7 per cent of the adults.

A tremendous contribution was made by the physicians of San Diego who gave generously of their time in helping plan the survey, serving on the review board, reading films, checking on the technical aspect of educational materials, approving publicity releases, and even attending neighborhood meetings in the evening to answer inquiries. In addition, the medical society itself, as an organization, participated actively in the planning and promotion of the survey.

And there were many other instances. For example: Staff personnel, such as nurses, public health educators, clerical personnel, were assigned full time to the survey. The military lent office equipment, desks, chairs, files, etc. A local company lent five trailers to house portable units located downtown. Electrical contractors rewired headquarters, paying the electricians out of their own pockets. These and many other services were contributed to the tune of about $20,000. These goods and services were vital to the solvency and success of the survey.

A word of warning, however. A community studying the costs of a mass x-ray survey cannot say, "San Diego spent only $117 for equipment; therefore, we'll need only, say, about $200." It is not possible to pattern the cost of any other survey after San Diego's or any city's. In planning, it is not safe to say, "San Diego got this or that for nothing, so can we." That assumption can come home to haunt a program. If there is a pattern to be observed from the San Diego experience, it is to plan a budget for the maximum amount—not assuming that anything will be free, donated, or sold to you at cost. Then, with an executive committee of men who know the community, the budgeters can make adjustments with regard to those items that firms and people have agreed to supply or sell at cost.

Factors affecting the survey budget include the community calendar of events, as well as the more obvious one of the character of the community. For instance, at election time the community cannot lend tables or screens; during the Community Chest drive that agency has already borrowed all available typewriters, etc.

Just as there are hidden results from a survey, so, also, are there hidden costs. From the dollar and cents angle, the impact of a mass x-ray survey will take a sizable chunk out of the local department of public health budget quite aside from the survey budget already mentioned ($37,200 in the case of San Diego). For example, the cost of additional personnel necessary at the tuberculosis clinic of the San Diego Department of Public Health amounted to $3,000; maintenance and operation expenses increase $1,610.

In the San Diego x-ray survey in the period January 1, 1950, to March 15, 1950, 160 cases of tuberculosis were reported. Sixty-eight of them were found by mas x-ray survey and 92 by private physicians, tuberculosis clinic and other non-survey methods. The increased awareness of the public is perhaps the only answer for this continuing increase of reported cases of tuberculosis. From a cost angle, this means that in addition to the three to five years necessary to complete the follow-up program of the x-ray survey, a continued expansion of the total tuberculosis control program can be anticipated.

A program of the tempo and scope of a mass x-ray survey pushes other programs into the background. In San Diego it was found:

1. The assignment of the entire staff of public health educators and nine public health nurses was the heaviest drain on personnel:
   a. Two public health educators full time.
   b. One (chief) public health educator—part-time.
   c. Nine public health nurses full time at retake center.
2. Certain programs were postponed:
   a. The department had to postpone for three months the preparation of an activity report.
   b. Bureau chiefs were asked to curtail public health education projects until after the survey.
   c. One major program, school vaccinations, was started earlier in the year, discontinued during the survey and was resumed after the survey ended.

From the larger viewpoint of costs to the government as a whole, 120 additional beds were added for the care of patients with tuberculosis. Perhaps this cost of additional beds should not be considered a cost, for the earlier discovery of these cases actually means dollars and cents saved.

Mass Survey—Its Future

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SUMMARY

Experience with a fast-tempo case finding survey in Seattle confirms the opinion expressed with regard to other areas, that the tools now are at hand to eradicate tuberculosis in Seattle in a 20-year period.

The most important single factor in controlling tuberculosis is segregation and treatment of patients with active cases — sanatorium care that is sufficient in quantity and quality.

Aggressive use of community-wide, mass x-ray program constitutes the second largest factor in controlling tuberculosis and has its greatest application in cities of over 100,000 population.

The cost of such a mass survey program is trifling when compared with the cost of an adequate hospitalization program. The Seattle experience indicates that the cost of a mass survey program amortized over a five-year period is only 2 per cent of the cost of one year of hospital care.

IN order to predict the future usefulness of mass survey efforts, it would seem reasonable first to attempt to evaluate the results of those that have been done already. A brief picture of the tuberculosis control situation in the state of Washington in 1948 will help to place the whole problem in a better perspective.

Since 1925 deaths from tuberculosis had been declining steadily until World War II broke out. The advent of war industries and the migration of new population halted this decline, and in 1946 Washington had gone back up to the higher figures experienced ten years earlier. It was not until 1936 that the total sanatorium facilities in the state added up to a ratio of one bed per annual death for the state. By 1944 the total available sanatorium beds equalled two per annual death, but many were unused because of personnel shortages. In 1945 the state legislature appropriated $3,000,000 for assisting counties with funds for capital outlay for sanatorium buildings. In 1949 this was augmented by $800,000. Two county sanatorium building programs have been completed and the third and final one will soon be started, as funds are now available. Because of high building costs it became apparent in 1947 that as much as $10,000,000 or $12,000,000 might be required to construct all of the sanatorium facilities needed and to replace obsolete frame structures. But by a stroke of luck the surplus Seattle Naval Hospital of 1,260 beds was acquired. Patients were moved into the larger quarters in November 1947. As a result of the building programs undertaken, combined with the fortunate acquisition of this surplus military hospital, making a total of nine county and two private tuberculosis sanatoria, beds for the care of tuberculosis patients now number 2,265 in the state of Washington, which establishes a ratio of five beds available per annual death. During 1948 the few remaining waiting lists for tuberculosis hospital care were gradually abolished as the sanatoria recruited personnel sufficient for adequate care of a full load of patients.

It has been apparent over the entire nation for several years that the tuberculosis death rates in metropolitan areas are higher than in rural regions, and that it has been found more difficult to conduct successful mass survey efforts in cities over 100,000 population than in less densely populated sections. The experience in Seattle has been similar: The Seattle death rate, allocated according to residence, was roughly 40 per 100,000 in 1948, contrasting with 20 in the rural portion of the state. Moreover, the work of the mobile x-ray units operating in the state was able to provide much more adequate coverage proportionately in the small and medium-sized counties than in the three large counties. Therefore, the U. S. Public Health Service was requested by the authorities of Seattle to lend x-ray equipment and personnel for the performance of a fast-tempo survey, attempting to cover the entire city. The organization of this survey was along the lines of big city surveys previously done in Minneapolis, St. Paul and Washington, D. C. The pattern of this organization is already well known and will not be discussed here.

What were the results of this effort? Were they worth while in this city of a half million persons? Just a very few statistics in answer: A total of 398,309 films were taken—99.6 per cent of the goal of 400,000. There were 14,331 persons (3.6 per cent) called back for 14 x 17 inch films because of some abnormality seen in the miniature films. There were almost exactly 4,000 cases of tuberculosis of reinfection type revealed on the 14 x 17 inch films secured. There were 374 cases of active tuberculosis discovered as a direct result of the survey. Of the number of persons thus found to have active tuberculosis, 296 (79 per cent) were actually hospitalized. There remained 78 persons with active cases not given sanatorium care because of various reasons, such as advanced age, adequate home situation, nonresidence, removal from the area, refusal of hospitalization, and death. There are still cases of active

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tuberculosis being identified from out of this collection of 4,000 reinfection cases originally revealed. In many of these cases prolonged observation was required to determine activity. As Summers[2] aptly stated, "Time might well be considered a fourth dimension in the determination of the significance of roentgen findings."

What has happened to the sanatorium case load? At Firland Sanatorium, the tuberculosis hospital that cares for Seattle and King County residents, there were 400 hospitalized patients in November 1947. The number had risen to 650 by September 1948, when the survey actually started. This expansion was accomplished simply by placement of patients known to have tuberculosis and by diligent effort on the part of the health department to persuade patients with known lesions to accept sanatorium care. By January 1950, one year after completion of the survey, the load of King County residents had risen to 1,060. This number does not include veterans or patients in mental hospitals. It is felt that this is the peak load right now and that a slow decline in total number of hospital patients soon will begin. In 1949, 160 King County residents died of tuberculosis. This means that there are 6.5 King County patients actually being hospitalized per annual death.

The first question requiring explanation is: If only 296 patients with active tuberculosis were hospitalized as a direct result of the mass survey in Seattle in the autumn of 1948, why did the case load rise from 650 in September 1948, at the beginning of the survey, to 1,060 in January 1950? In other words, more patients with active tuberculosis not discovered in the survey were admitted to the sanatorium during the 18 months after the survey started, than came in as a direct result of the survey. This occurrence is looked upon as the outstanding "by-product" of the survey. Originally it had been expected that some 800 active cases, or two per thousand population, would be found as a direct result of the survey. The total number of active cases found and reported in the community through other channels than the survey since September 1948 has been 670. Therefore, the non-survey cases exceed the survey cases by 80 per cent during this time. How have these cases been found? First, a higher index of suspicion on the part of the practicing physicians has been a major factor. More persons are being examined in doctors' offices with the possibility of tuberculosis being kept in mind. Second, three of the general hospitals in the county are employing routine x-raying of persons admitted to hospital. This is a very valuable case-finding effort, and two of the hospitals did not begin it until after the survey ended. One in particular, the county general hospital, is now regularly finding active cases of tuberculosis in patients admitted, particularly in the older age group. The majority of these cases are being discovered in persons who were not x-rayed in the fast-tempo survey in the autumn of 1948. In some cases the lesions have developed since a "negative" film in 1948. In a very few there was evidence on the miniature film of 1948 that was overlooked or was thought to be too insignificant to justify follow-up at that time.

One result that seems important is the finding of so many cases in the areas of the city in which economic standards are low. The "flop-house" district and the jail are fruitful sources of new, active cases, and careful attention will be given to them in future case-finding efforts. Mentioning the jail leads naturally to a discussion of recalcitrant patients. As long as there were waiting lists for the care of cooperative patients, very little effort was expended on coercion of the uncooperative. However, at the conclusion of the survey, Dr. John H. Fountain, tuberculosis control officer, Seattle City-King County health department, felt that the time was propitious to begin to use legal measures for some patients if the educational effort on the patients seemed ineffective. In December 1948 the rules and regulations of the State Board of Health had been revised to make very specific the authority of a local health officer to isolate or quarantine a person with tuberculosis when necessary to protect the community. During 1949 these regulations were applied in an ever-increasing number of instances, so that as of the end of March 1950 there are 67 patients in the sanatorium under isolation order of the Seattle City-King County health department. In addition 12 patients whose home surroundings are thought to be reasonably suitable for the care of patients are isolated, by order, at home. Most of the 12 are elderly or have silicotuberculosis. In no instance are there any small children in the home. In addition, there are at home only 40 persons with communicable tuberculosis known to the health department, not under isolation order. All of these persons are under periodic surveillance of public health nurses and if there is any evidence of failure on the part of the individual to cooperate, legal isolation measures are employed. The objective of the next few years is to reduce to zero the number of patients with active tuberculosis who remain at home. It has already been done in several of the small and medium-sized agricultural counties. The industrial and metropolitan areas such as Seattle, Tacoma and Spokane, having a much larger problem, naturally will attain the goal more slowly. There have been many other valuable results of the fast-tempo mass survey, both direct and indirect. Some of these have been previously described elsewhere.[3]

COST OF SURVEY

The community-wide, fast-tempo x-ray survey in Seattle cost $256,316.72 to all participating agencies, with the U. S. Public Health Service supporting over one-half of the total cost. The great majority of the local contribution was from Christmas seal funds supplied by the Anti-Tuberculosis League of King County. The cost per case of finding the 4,000 cases of tuberculous reinfection was approximately $64—very, very cheap case-finding. For the 374 active cases found so far, the cost per case was $685.33. It is reasonable to believe that the follow-

up at the end of five years will show a total of about 500 active cases discovered at a cost of approximately $500 each. In addition, there will be active cases found amongst the contacts in future years to help reduce the cost per case well under $500. Obviously, it is impractical to do any cost accounting on the cases found apart from the survey, but these by-products are all "clear profit." The expenses of case-finding are chargeable to the tuberculosis prevention account which is trivial as compared with the tuberculosis hospitalization account for care of patients with active cases in sanatoria. For example, in 1949 there was an average of 955 King County residents receiving hospital care at the sanatoria. The cost per year for that number of patients at $7.57 per day is $2,638,871.32. If the quarter million dollars of mass survey were amortized over five years, then the amount spent annually for that prevention effort would be about 2 per cent of the annual hospital costs. Moreover, the cost of finding one case of active tuberculosis is only the equivalent of 66 days of hospitalization expenditure for the care of a patient. As approximately half of the quarter million dollar cost of the mass survey was paid by the U. S. Public Health Service, the cost locally was the equivalent of the cost of 30 days of sanatorium care for a patient with active tuberculosis.

What of the future? The author believes fully in the philosophy advocated by Dr. Emil Bogen in an editorial that appeared in the *American Review of Tuberculosis* for June 1949, "Ten Beds per Annual Death for Eradication, Not Reduction of Tuberculosis." With the knowledge at hand, why not do it? Some areas are well on the way. For example, in 1949, in Minnesota, a semi-industrial state, tuberculosis had dropped completely out of the list of the ten leading causes of death. Michigan may have had similar experience. The provision of adequate facilities for segregation of known, active cases, plus periodic saturation mass x-ray surveys, combine to be the two major tools. How long should these community-wide mass surveys be continued? It has been recommended to the counties in the state of Washington that those counties with annual death rates of under ten per 100,000 have just one more survey and try to do a good job with the goal of 100 per cent coverage of adults (this to be considered as a "mop-up" operation) and that thereafter they be content with a program consisting of: (1) Follow-up of known cases, (2) periodic examination of contacts of known cases far into the future, (3) return to tuberculin testing in schools as an inexpensive yet useful tool when applied to a community with a low death rate. For those counties with death rates of 10 to 30 per 100,000, two surveys five years apart. For the half-dozen counties with death rates higher than 30, or with new population expected as a result of Grand Coulee irrigation or other developments, three surveys, spread over 15 years, would seem to be a good recommendation. All of these recommendations to be modified in the future based on information developed subsequently.

COMMENT

It is necessary to comment a little regarding the impressions of the Seattle survey. The persons particularly interested in the non-tuberculous findings, such as abnormal hearts and chest tumors, were distinctly disappointed in their findings and have come to the conclusion that as far as approach to the public is concerned, community-wide mass surveys should be considered a tuberculosis case-finding method, with other findings incidental and of only minor importance. Another thought that has been developed is that the community-wide, fast-tempo mass survey is not the sum total of all case-finding efforts. In between mass surveys there will need to be a sustained case-finding program. This would be through clinics with examination of contacts and ex-sanatorium patients, the routine x-raying of hospital admissions, periodic industrial surveys and perhaps even some schools for the educational value thereof. The fast-tempo technique utilizing multiple machines seems to be the easiest to handle and the most effective so far. The annual programs of community-wide case finding, surveying only a small percentage of the total population of the community, would seem to be wasteful effort.

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Community Rehabilitation Program

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SUMMARY

A broad outline of a community program has been given, with particular stress on in-sanatorium facilities.

It is reasonable to conclude that rehabilitation is feasible, desirable and economically sound.

The object of the program is complete rehabilitation in all categories of the greatest possible number of persons incapacitated by tuberculosis.

THE official definition of rehabilitation in tuberculosis as adopted by the National Council on Rehabilitation in 1946 is as follows: "Rehabilitation in tuberculosis is the restoration of the tuberculous to the fullest physical, mental, social and economic usefulness of which they are capable." No one will question that as a definition of the ideal goal.

In any program of rehabilitation the following must be considered.

1. The need for rehabilitation in the tuberculous of the community.
2. Community resources for:
   A. Employment opportunities,
   B. Training opportunities,
3. Provision of personnel and finances for an adequate program.

NEEDS FOR REHABILITATION

It has been reported by various authorities that 15 per cent of those disabled by tuberculosis should be candidates for rehabilitation. This percentage is based on the consideration that 50 per cent will be invalids in hospitals or their homes the rest of their lives; 30 per cent will be able to return to their former work without rehabilitation; 5 per cent will be children under 16 years of age.

In the author's opinion, considerably fewer than 15 per cent of patients are subject to rehabilitation.

In San Diego County 440 patients were discharged from the sanatorium in the past two and one-half years. During the same time 171 patients were referred to the State Department of Public Health as candidates for rehabilitation, and of these approximately 40 were accepted and entered training. The rest were rejected for medical or other reasons. The number accepted represents far less than 15 per cent of the patients discharged.

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Presented at the annual meeting of the California Tuberculosis and Health Association and the California Trudeau Society, March 30-April 1, 1950, San Diego.

COMMUNITY EMPLOYMENT AND TRAINING RESOURCES

A complete survey of employment opportunities and employer attitudes should be made in any community contemplating a complete rehabilitation program. The chamber of commerce is a good source of information as to employers and opportunities. In addition, employment agencies know employment trends. Contact with individual employers as to employment opportunities and employer attitudes might be undertaken by the local tuberculosis association. Education of the employer to the desirability of hiring persons who have had tuberculosis can well be carried on by the educational director of the tuberculosis association if time is available. Compensation insurance rates in industry, as they exist in California, are not affected by the hiring of persons who have had tuberculosis.

Training opportunities vary in each community and they are well known by the Bureau of Rehabilitation. Training placement should, whenever possible, be made near the home of the patient to reduce expenditures to the minimum. Training for an occupation for which no employment is available or in which there is a surplus of labor is fallacious and can be avoided by careful study of local problems.

PERSONNEL AND FINANCES

Essential personnel in a rehabilitation program include some of those ordinarily employed in vocations whose duties may be easily extended to cover needs of a rehabilitation program. These include medical social workers, occupational therapists, adult education teacher personnel and librarians. A director of rehabilitation, psychiatric social worker and possibly a psychiatrist represent additional personnel that might not otherwise be employed. Whether a vocational counsellor should be employed by the sanatorium or this service furnished by the state rehabilitation office is a debatable point. In larger institutions a counsellor is desirable and in some the counselling may be done by the director of rehabilitation. In any event, finances must be provided for employees, equipment and supplies. Five per cent of the total budget has been suggested as a reasonable amount to provide adequate rehabilitation services. Certainly it is a difficult matter to convince boards of supervisors that such amounts are justified. As an illustration, the cost per patient day in Vauclain Home is $8.66. Five per cent of this is 43 cents per patient day for rehabilitation, or approximately $35,000 per year. Obviously this is a staggering figure for a sanatorium with an average load of 220 patients. At Vauclain Home, a director, a counsellor and the service of a psychiatrist are all that need be added.

Even then, the potential load of rehabilitation cases would need to be greatly increased to justify such expenditures. It would appear that, where partial services already exist, a 1 or 2 per cent increase in budget would be adequate to provide essential rehabilitation services in the sanatorium.

SERVICES AND FUNCTIONS

Certain services and functions are essential to a rehabilitation program and they deserve careful consideration. These can be broadly considered under the category of physical, mental, social, vocational and economic rehabilitation of the patient.

The physical rehabilitation of the patient is the primary responsibility of the medical staff. Methods used for this phase of rehabilitation are well known and do not properly enter here. However, it might be well to discuss the function of the medical staff having to do with other phases of rehabilitation. All phases of rehabilitation from the time of the admission of the patient, including educational training, occupational therapy and vocational counselling, should be given on advice of the medical staff after proper evaluation. The medical staff determines timing of all factors based on the physical condition of the patient. More time should be spent in the careful instructions of the patient as to the disease, what he must do to get well and remain well and how he can best live with the disease. Modern treatment of tuberculosis has advanced so rapidly that physicians tend to become concerned with the purely medical side of tuberculosis and its management. There is a tendency to give less attention to the patient as a human being with feelings, worries, a home and family and problems of the future. Such phases of patient care have been left to others, principally the medical social worker. The doctor must retain the relationship of physician, advisor, father confessor and teacher, to the end that physical rehabilitation may be augmented and maintained by a new way of living, taught principally by the physician.

The physician must also make a careful evaluation of the patient's condition on the basis of ability to fill the job for which he is to be trained, and must decide when training is to start. He is an important component of the team that makes a complete evaluation of the patient as a rehabilitation entity. The physician is the only person who can properly interpret the condition of the patient to the rehabilitation officer.

Another part of the medical team, not always available but highly desirable, is the psychiatrist. By proper psychiatric evaluation at the time of admission or even later, the patient's problems, reaction to environment and any corrective measure may be ascertained. Continued observation will discover trends that point to difficulties that may affect vocational rehabilitation. Routine psychiatric evaluation of all patients admitted to the sanatorium is desirable but seldom available. Findings elicited can be of inestimable value, particularly in the period immediately following admission. In the absence of a psychiatrist the chest physician must be keen enough and take enough time to study and evaluate the problems presented, aided by the medical social worker and other important members of the sanatorium team.

The public health nurse handles problems of family contacts, explaining to them the disease and its possibilities, and is a definite factor in the adjustment of the patient and family to the diagnosis of tuberculosis. After discharge, she assists the patient in fitting into normal life without jeopardizing his life or that of others.

The sanatorium nursing staff are of distinct value in obtaining the cooperation of the patient, assisting in his education in tuberculosis and building morale.

They learn his interests, assets and liabilities by daily contact. The value of information supplied by the nursing staff cannot be overestimated.

The role of occupational therapy in rehabilitation is so important that a well staffed and well equipped department is essential. Occupational therapy bridges the gap between medical therapy and vocational training. Most physicians accept the value of occupational therapy in its therapeutic sense as purely diversional. It stimulates the patient's interests, improves morale and aids in improvement of muscle tone during convalescence. As prevocational therapy, it has even wider application. Development or eliciting of dexterities is often useful for training purposes. Observation of skills and interests may give leads as to choice of occupation. The occupational therapist must always keep in mind the primary purpose of her work and must minimize the possibilities of certain types of work in which the patient may engage, largely for its monetary advantages, while in the sanatorium. Occupational therapy must remain an integral part of sanatorium treatment, not the function of an autonomous department interested primarily in filling a cabinet with articles for sale made by patients.

Adult education is an essential service which is usually provided by the local school system. Teacher time available is based on average daily attendance. The work of the adult education staff should be integrated with that of the occupational therapy department, particularly as it pertains to specific lines of interest as shown by the patient.

Adult education has a definite therapeutic value in that it offers the patient an opportunity to increase his knowledge and make up deficiencies for which he has previously not had time. Many fields open in rehabilitation require the possession of a high school diploma, and making up this deficiency will save much time later. A wide group of subjects can well be taught along special lines for training preparation. Interests of the patient, as observed by the adult education teacher, are of definite help to the rehabilitation officer and, conversely, the rehabilitation officer can suggest subjects which will aid in preparing the patient for training in an oc-

cupation which he has chosen. Such preparation again shortens post-sanatorium training periods.

Medical social service has three phases as it affects rehabilitation. These are grouped under general welfare services, personal service to the patient, and vocational problems. Under general welfare the social worker studies the patient and family as to the problems present. She coordinates work with the welfare department for relief. The problem of child placement, supervision and protection and delinquency, with proper referral, are essential services for the patient and family. Budgeting problems loom large in her sphere of action.

She renders an invaluable service to the patient in combating apprehension as to social status and marital problems and the proper care of children. She aids the medical staff in developing a sympathetic attitude and genuine understanding in the family attitude to the patient and his problem. Her knowledge and advice are needed in removing emotional conflicts at time of admission and discharge and as they pertain to rehabilitation problems.

She can furnish information about family backgrounds, problem of attitudes, work interests, ambition and frustration, and she can evaluate their possible effect on rehabilitation. She can advise as to the proper time for rehabilitation services based on familiarity with social and emotional factors as affecting the training program. In the absence of a psychiatrist, the work of a sincere and well trained social worker is of invaluable service in this phase of rehabilitation.

VOCATIONAL COUNSELLING

When possible, a single worker for counselling and training is preferred in order to maintain continuity in the program. Prevocational counselling should begin early during the patient's sanatorium stay and the service should be offered to all patients except those with an obviously bad prognosis. The same rehabilitation officer should then follow the patient through the sanatorium phase and on through post-sanatorium care, training and job placement. The amount of time allotted to each patient must be determined by the case load of each rehabilitation officer. A vocational counsellor, as a staff member of the rehabilitation program in the sanatorium, may be necessary and advisable where individual case loads are high. Each step in the entire program involving increased activities is added only on medical approval.

The various methods and techniques of the rehabilitation officer are not within the scope of this discussion, but follow fairly well established lines.

As mentioned earlier, the office of the department of rehabilitation plays an important part in finding job opportunities. The rehabilitation officer must maintain good relations with employers, interpret to the employer the abilities of trainees, any limitations and other pertinent facts. He is responsible for the introduction of the trainee to his job and his adjustment thereto. He should continue supervision and maintain a continuing relationship with client and employer till a satisfactory adjustment is established. After this period, occasional contact should be maintained for a period of two years or more until it can be said that rehabilitation is completed. Medical supervision continues at stated intervals without limit as to time.

ORGANIZATIONAL PARTICIPATION

On a community-wide basis, participation in a rehabilitation program should be accepted as a sound philosophy. It pays real dividends in that the ultimate goal is to make a self-supporting patient population out of an otherwise definite welfare problem complicated by the presence of a communicable disease in which the relapse rate is high. No one will question the fact that rehabilitation in a suitable occupation under continuing medical supervision reduces the relapse rate and the number of sanatorium readmissions. The long range benefit in satisfaction and in dollars saved is real and substantial.

The sanatorium remains the center of rehabilitation activities aided by the active participation of the local tuberculosis association, by assistance in related fields given by the chamber of commerce, by employment services and by employers. The welfare department must be convinced that it should furnish adequate maintenance during training for persons unable to finance their own. County boards of supervisors, as the governing body and guardian of public funds, must be shown that a program for rehabilitation is desirable and feasible and economically sound.

SPECIAL PROBLEMS

There are many special problems in rehabilitation, such as use of sheltered work shops, provision of adequate diet, employment of the patient with sputum occasionally "positive," and the handling of the private patient. Discussion of such problems enters into a very controversial field involving principally public health control. The patient of the private physician, treated outside the sanatorium, probably needs no financial aid. One important phase of the program is available to such a patient and should be used by him — the counselling service, which the bureau is glad to give on the recommendation of the patient's physician.

The Role the Care and Guidance of the Patient Play in the Treatment of Pulmonary Tuberculosis

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THE care and guidance of the patient in whom the diagnosis of pulmonary tuberculosis has been established is a phase of tuberculosis work which, I believe, in general has not received the consideration it should. It is a phase of this work to which those engaged in research have devoted relatively little or no attention. There is no part of this work in which there is a greater diversity of opinion and action, yet it particularly involves the crux of all our efforts, that is, the prevention of death or chronic invalidism from pulmonary tuberculosis—a disease now acknowledged as curable.

In a brief review of the history of tuberculosis control it becomes apparent that the countless measures tried both in the prevention and the treatment of this disease down through the centuries have up to the past two or three decades been found wanting. And there is still no specific means for the control of this disease.

The use of BCG as a preventive measure must still be conceded to be in the experimental stage. The antibiotic drugs, while promising, are only adjuncts in treatment to be used always with a clear understanding of their indications and contraindications and only as an aid to the usual, accepted measures of treatment. When used otherwise, they may be harmful.

In reviewing more recent history it is found that during the past 50 years tuberculosis as a cause of death has dropped down from first to seventh or eighth place. But that information does not mean all that might be implied. Of all chronic preventable diseases, pulmonary tuberculosis continues to present the most important medical, public health, social and economic problems throughout this country. It is still the first cause of death in that very important age period from 15 to 35 years — the formative and productive period of life. It is estimated that there are at least 500,000 open cases of tuberculosis in the United States at present—one half of which as yet have not been found. This vast army of patients continues to sow the seeds of new disease—a disease that strikes its greatest blow in the prime of life.

Fortunately there is a bright side to this somewhat gloomy picture of tuberculosis. Science and clinical experience, especially during the past two or three decades, have placed at our command the measures essential for the control of tuberculosis. Today, continuous spread of this disease is unwarranted and death or chronic invalidism from tuberculosis is unnecessary. They are the result of neglect to use the measures at hand. There are a few districts in this country where these preventive measures have been put into effective operation with the result that, for practical purposes, tuberculosis has been eradicated in those areas. In a group of counties in southern Minnesota there are approximately 300 small town and rural elementary schools where there is not a child that has been infected with the tubercle bacillus. It is true that circumstances differ in different localities. The underlying principle, however, is the same. The results obtained in any area will depend on the type and intensity of the effort made.

It is a provocative thought, particularly to those of us engaged in this work, that of the nine leading or first causes of death, tuberculosis is the only one that we possess the means to eradicate.

Fundamentally, control of tuberculosis is through education—education of the public to prevent it and education of the patient and those near and dear to him to cure it. The medical profession, the profession as a whole, is primarily responsible for this education. All our national organizations concerned with the control of tuberculosis now realize that the opportunity for all physicians to obtain a practical working knowledge of tuberculosis while they are medical students has been one of the most overlooked factors, and at the same time the most important, in tuberculosis control. The general practitioner or family physician, because of his close association with the family, must occupy an important place not only in the prevention of tuberculosis but also in the treatment during what are ordinarily termed the pre- and post-sanitarium periods. The application of the principles of treatment during the active stage of the disease, or during that stage which is ordinarily called the sanatorium period is, however, a highly specialized field necessitating extensive training and experience. In the guidance of the patient with active tuberculosis back to health there are some four or five educational factors, paramount in the adjustment of the patient to the cure, which the patient and those near to him should clearly understand at the outset—that is, before the patient enters the sanatorium or begins the cure.

These factors are:

1. Pulmonary tuberculosis, regardless of the extent of involvement apparent in the lungs, always seriously endangers the life of the patient unless and until it is brought under control. On the other

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President's address, delivered before the Annual Meeting of the California Tuberculosis and Health Association, San Diego, April 1950.

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hand, if the patient has the right advice and guidance and the ability to undergo the necessary treatment, he has an opportunity to regain his health and to live as long and as useful a life as he would have lived if he had not had tuberculosis. For the mental rehabilitation of the patient it is important for him to understand the possibilities as they pertain to cure of the disease. Mental rehabilitation is so closely entwined with the treatment or physical rehabilitation that it should also be begun at the outset. The two must be carried along together throughout the course of the disease. If this procedure is followed, when the disease is overcome the rehabilitation is complete.

2. The treatment of pulmonary tuberculosis does not consist of the administration of medicines or drugs; it is, rather, an agreement or contract between the patient and those near to or responsible for the patient, and the physician. The purpose of this agreement or contract is to devise and carry out a mode of life for each patient that will enable him to regain his health. In this contract it must be understood that the patient undergoes the treatment for cure, the physician provides the means by instruction and guidance, while those near to the patient occupy a position of determining influence. The outcome is determined for the most part by the efficiency with which each party to this agreement discharges his responsibility.

3. A certain proportion of patients, estimated to be one out of every four, who have pulmonary tuberculosis, even though the disease may be in the advanced stages, will overcome the disease and regain health without treatment, or in spite of treatment, if the treatment which may have been instituted does not interfere with the normal course of the disease. These are patients who have what is classified as the resolving type of pulmonary tuberculosis—a type of the disease which is not influenced by treatment. The reasons for the development of this type of disease in some patients are not entirely clearly understood. They are usually explained on the basis of the size and severity of the initial infection and the degree of the allergic response to the infection. It is patients with this type of disease who are responsible for the popularizing of unorthodox special types of treatment or treatment by quack remedies and nostrums. The other three patients out of the four, if they were to attempt to overcome the disease without rational treatment, would die of a disease that is curable. At the onset there are no means by which it can be determined in which patients the disease will clear up if treatment is not instituted. All patients must take the steps toward cure and be guided with the utmost caution until it is clearly evident what course the disease will follow.

4. There are no two patients in whom pulmonary tuberculosis develops in the same way. Likewise there are no two patients who respond to therapy in the same way. This is true because there are no two patients who have the same resistance to the tubercle bacillus and the products of its growth and destruction. There are no two patients who are infected with the same dosage of tubercle bacilli or with bacilli of the same virulence. There are no two persons who are able to adjust themselves to the cure in the same way. And there are many other variables. There are a few general principles that apply to the care of all patients with tuberculosis, but the details of treatment must be worked out for each patient according to the indications in any particular case. It is attention to details that cures tuberculosis. It is neglect of details that causes death. The institution of and the carrying out of the details essential for the individual patient are made possible only by a close patient-physician relationship, a relationship attained through a mutual understanding and a mutual confidence.

5. Tuberculosis is not cured by climate or diet or drugs or by exposure to the sun's rays. Experience has demonstrated that when the treatment which patients receive is relatively the same, the results obtained in the different climates in different parts of the country are relatively equal. There is no special diet for the treatment of tuberculosis. Patients with this disease require a balanced nutritious diet. They should not be overfed. The digestive system needs rest as does the body as a whole. The diet should be regulated so that patients who are underweight gain at the rate of three or four pounds a months up to normal or a little above normal, and the diet should then be adjusted to hold that weight. The type and quality of the food and the manner in which it is served should be such as to tempt the appetite. It is best that the food be served in three fairly equal meals a day, avoiding between-meal feeding, except in special cases, as it tends to interfere with the appetite for the regular meals. It should be made clear to the patient that eating is a habit and that not eating is a habit and that appetite comes with eating. The patient's attitude toward food and toward his ability to take it and digest it are the determining factors as to whether or not he is able to take and digest his food.

Drugs or medicines other than the antibiotics, if and when used in the treatment of tuberculosis, are used to treat symptoms and complications. Patients adjusted to the regimen for cure, regardless of the stage of the disease, rarely have symptoms or complications. When patients following the necessary physical regimen have symptoms, the symptoms are, with a few exceptions, functional rather than the result of organic disease. They are the result of the physiology of the body being disturbed by the emotions. These symptoms are real—not imaginary. The treatment in these circumstances is not the administration of drugs which will further upset their physiology. These patients need vocal sedative; they must be talked to so they will understand and be reassured and relaxed. The treatment of pulmonary hemorrhage with narcotics or sedatives which interfere with or destroy the cough reflex is an illustration of the possible deleterious effect resulting from the disturbance of the normal physiology by

the use of drugs. The usual result of this method of treatment of hemorrhage is retention of the aspirated blood, atelectasis, and dissemination of the tuberculosis. The treatment for pulmonary hemorrhage is reassurance.

Sitting in the sun's rays, especially in the heat of the day, is mentioned only to be condemned as a hazardous procedure for patients with active pulmonary tuberculosis.

In brief the treatment of pulmonary tuberculosis is the management of the person who has it—management from every angle, especially the psychological. More specifically, it is the outlining of a mode of life for each patient according to the indications in his case and the control of the patient so that he follows that mode of life in strict detail. The basis for this mode of life is rest and time—rest carried out over a sufficient length of time to accomplish the desired results. Physiologists regard rest as the natural defense of the body. Cannon, in discussing rest, expressed the belief that every physician knows that, given rest (rest for the body) and peace of mind (rest for the mind) and proper food, 90 per cent of patients will get well. Allen Krause, writing about rest in the treatment of tuberculosis in 1918, said that until ever patient on being asked, "What is the most important factor in the treatment of tuberculosis?" will unhesitatingly answer, "Rest," the discussion of the subject will always be timely.

Rest for a patient with pulmonary tuberculosis is not synonymous with the term rest for a tired healthy person. In the treatment of tuberculosis, while the quantity and duration of rest are important, the basic emphasis must be placed on the quality of rest. Rest for a patient with tuberculosis means lying in the horizontal position, mentally and emotionally relaxed, 24 hours a day, seven days a week and 52 weeks a year, for as many months or years as may be necessary for any particular patient to control the disease. Patients should know that by injudicious activity it is possible to undo in five or ten minutes what they have accomplished in months. Patients should be instructed to lie for the most part in that position which is the most comfortable. They should be told, however, to turn on either side, using as little energy as possible, every three or four hours during the period they are awake, for 10 or 15 minutes, so as to promote pulmonary drainage. Frequently cavities are located toward the posterior part of the lung, and this maneuver will tend to decrease useless cough and relieve toxemia by facilitating drainage of these areas. The duration and extent of intensive rest will be determined by the extent and acuteness of the disease, the physician's control of the patient and the ability of the patient to adjust himself to the regimen for cure. Patients with active pulmonary tuberculosis must be trained to follow a strict regimen. Any permitted deviation, especially at the outset, from a strict regimen tends to lead to other deviations. When patients are in the semi-reclining position the vertical excursion of the lung during respiration ordinarily is not as great as it is in the horizontal position but, when they are permitted to assume the reclining position, patients, as a rule, interpret the liberty as license to indulge in various other oftentimes harmful activities.

Mental and emotional relaxation is imperative. Without it physical rest is impossible. As Pinner pointed out, being in bed is not bed rest for a patient with pulmonary tuberculosis. When a patient is not controlled mentally, emotionally and physically he will consume needless energy and at the same time interfere with the delicate healing process in the lungs and flood his system with toxins and bacilli from the pulmonary foci by fretting and fussing and worrying, by twisting and turning and lying in strained positions and pulling at the bedding, by excesses in talking and being talked to, in reading, in writing, in listening to the radio and countless other needless activities. Any activity—mental, emotional or physical—increases activity in the lungs and of the lungs. The objective is to reduce lung activity to a minimum. The more nearly patients, especially those with acute disease, approach the state of vegetating, the more gratifying the results.

Mental and emotional rest for the patient with pulmonary tuberculosis is secured by treating the patient as a person. The primary factor in treating the patient is to tell him the truth. It is the uncertainties or the unknown in life that upset persons, regardless of what walk of life is involved. To patients with tuberculosis the truth may be and often is a great shock at the outset, but in practice it is only by knowing and understanding the truth that they are able to adjust themselves to the situation and to meet it with intelligence and efficiency.

When the diagnosis of pulmonary tuberculosis is established, the physician must take time, usually one to two hours or longer, to talk to the patient and those near to the patient. He should have the opportunity to tell them about the patient's tuberculosis. He should show them the x-ray pictures of the patient's chest and compare these pictures with the pictures of a normal chest, and with any previous pictures of the patient's chest that may be available.

In spite of the difficulties that arise in the interpretation of x-ray pictures of the chest, the explanation of the patient's pictures to him has a pronounced as well as a gratifying influence in enabling the average patient to visualize the disease and to adjust himself to the cure. The patient, and those near to him, must be told about the cure. They should understand what is meant by the cure, the part the patient and those responsible for the patient must play in it. They must understand what and what not to expect from the physician. They should always understand that it is the patient who has tuberculosis, that it is the patient's life that is at stake, that it is the patient who must follow the regimen for cure, and that there are no short cuts to recovery.

There is nothing that will save the physician's time more than the preparation of the patient and those on whom he depends for the task ahead, by a painstaking explanation of the situation as a whole before the patient begins to follow the regimen for cure. With this approach, and with the advantage of the right atmosphere, it is rare after the patient begins the cure that it will be necessary for the physician to spend more than a moment or two with the patient as he makes his observation rounds.

A sanatorium must not be regarded as just a place where the patient has a bed and a tray and a nurse and a physician. A sanatorium, if it serves its purpose, is in the first place an atmosphere in which each patient is leading the kind of life he must lead for cure of tuberculosis. Consequently, each patient has the moral support and mutual sympathy of all the other patients as well as the beneficial influence of mass psychology. These factors exert a powerful influence in enabling patients to adjust themselves to the regimen. In the second place, a sanatorium must be an educational institution where the patient is taught and trained how to get well and stay well.

Many and varied "reasons" are presented for patients' leaving sanatoria against medical advice. Most of these reasons are in reality only excuses advanced by the maladjusted patient. There are three fundamental reasons for patients' leaving the sanatorium contrary to a physician's advice. They are:

1. Failure of the physician to "sell" the cure and himself to the patient and to those responsible for the patient at the outset.

2. Failure of the sanatorium to perform its function as an atmosphere conducive to the patient's adjustment to the cure.

3. Occasionally, uncontrollable psychological imbalance in the patient, independent of tuberculosis.

In other words, when the patient has been skillfully approached by the physician before he enters the sanatorium, and has had the disease and the cure explained to him, he enters the sanatorium with optimism and a determination to recover. The patient's ability to adjust himself strictly to the regimen for cure will depend for the most part upon the influence which his physician has over him and upon his environment.

The degree to which any patient has controlled his disease is determined largely by the reaction of his condition to graduated exertion. The physician must be the judge as to when graduated exertion may be prescribed. Such exertion is very carefully increased and carried out in a systematic course under close supervision which enables the physician to observe the reactions and to guide the patient to a physical and mental state of rehabilitation.

Mechanical and antibiotic therapy should be considered in the care of all patients. At the beginning, however, unless there are definite indications to the contrary, all patients should have an opportunity for a period of time, usually from three to six months, to demonstrate whether or not they can control the disease on the rest regimen alone.

Pinner expressed the opinion that the physician's estimation of the value of rest in the treatment of pulmonary tuberculosis is entirely dependent upon his willingness to try rest over a sufficient length of time and under circumstances that would enable him to have a knowledge and understanding of what rest will accomplish. Peck expressed the belief that, for the most part, physicians turn their backs on rest by giving it lip service only, and that in most sanatoria today collapse or mechanical therapy is so extensively carried out that there is no opportunity to determine what rest alone will do. Mechanical treatment of pulmonary tuberculosis is now developed to a high degree of efficiency. Today it saves the lives of a vast number of patients with pulmonary tuberculosis and restores them to a social and economic state of efficiency. The antibiotics are likewise instrumental in enabling many patients with tuberculosis to regain health.

Mechanical and antibiotic therapy, however, are not the treatment of pulmonary tuberculosis. Rest is the treatment. Mechanical therapy and the antibiotic drugs supplement rest, but they do not supplant it.

Psychiatry and Tuberculosis

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SUMMARY

Studies on the psychosomatic aspects of tuberculosis have not brought to light a clear-cut correlation between a specific personality structure and susceptibility to the illness. The recommendation is made to look for several rather than for one personality type. It is suggested that people should be studied who react to stress with loss of appetite and loss of sleep. This character structure in contrast to that where the person withdraws into sleep and overeats might make a person prone to tuberculosis.

The somatopsychic influence of tuberculosis needs to be interpreted in terms of the localization of the lesion as well as infectiousness and conspicuousness of the disease.

Some common sociopsychological factors of tuberculosis have been mentioned. Reports on mental illness and tuberculosis and on diet were reviewed.

IN one of the first studies of the psychosomatic aspects of tuberculosis, Anita Muhl outlined the personality structures of tuberculous women which, she said, are common to all. She said, "Tubercular have a two-fold mixed personality which shows strongly marked introverted qualities suggestive of a precoxlike pattern on the one hand and extroverted tendencies with a manic-depressive-like swing of greater or lesser intensity on the other."

It is hard to consider this description a very specific one, since the extent of the mixture could make a person predominantly extroverted or introverted, predominantly happy or predominantly unhappy. Too great a variety of people could fit this description.

Muhl stated, further, that "the common features are inertia, fatigability, oscillating mood, perseveration, irritability, converted sex trends in the form of masochism and sadism, suggestibility, hypersensitiveness, regressive and suicidal trends, depression and abnormal respiratory behavior." She added that "wherever there is a combination of suggestibility, with both masochism and sadism well marked, there is also found evidence of dissociative trends with strong bisexual features."

Assuming that all these personality traits were really found in most tuberculous patients, would it not be logical to ask how many of these traits are likely to be the results of tuberculosis rather than its predisposing cause?

In the Army study by Friedman, Kastlin and Kooperstin, the following personality description is set forth: "These patients showed independence and efficiency which made them normally or better than normally adjusted in their economic, sexual and social spheres. They showed some resentment toward authority. They showed obsessive and compulsive characteristics and were optimistic individuals."

Try to consider that description from the point of view of a physician sitting on an Army draft board. Could he justify the rejection of people so described on the basis that they are likely candidates for tuberculosis? Again it would seem that this description is too general and would not be specific for people who have a predisposition to tuberculosis.

Frequently investigators describe cases in which a severe emotional stress, accompanied by sleeplessness and loss of appetite, may have decreased a person's resistance to the point where it was so low that he was easy prey to tuberculous infection. There are many interesting cases described in which patients did not recover until something happened which gave them a new incentive to recover. For instance, in one case the mother-in-law died. Soon afterward, the patient made a miraculous recovery. And cases are described in which lack of incentive caused a rapid, downhill course in spite of minimal lesion and excellent physical care and treatment.

It is impossible to work in a tuberculosis sanatorium without being impressed with the number of cases in which an emotional conflict seems to retard recovery or in which a patient who has previously done well has relapse on the basis of some major change in his life situation.

Neither in the articles already cited nor in others in the literature does there emerge a clear-cut personality structure which would point to a precise predisposition for tuberculosis and give definite indication for psychotherapy to prevent this disease. The author believes that the reason for the lack of such a clear-cut personality structure is an attempt to find just one personality configuration rather than several. In studies on accident-proneness, Flanders Dunbar found at first no clear-cut structure, but later discovered that there were several types of people who are accident-prone. Further studies of the psychosomatic aspects of tuberculosis are needed which start with this idea: There might be more than one character structure which creates susceptibility to tuberculosis. Take famous

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persons who had tuberculosis, men such as Keats, Stevenson, Goethe, Mozart, Voltaire, Kant, and Adolf Hitler; juxtapose a cross-section of the patients in the average sanatorium and attempt to find a common personality structure. The confusion will be that which is manifest in the present literature.

But certain aspects of personality might have some relationship to susceptibility for disease. There are those who react to stress by not eating, by not sleeping, by overactivity; others react by overeating, fatigue, a tendency to sleep all the time, and by inactivity, sometimes culminating in the complete immobility of catatonia.

Respiratory reaction to stress and the relationship of it to the disease might be another subject for investigation.

SOMATOPSYCHIC ASPECTS OF TUBERCULOSIS

In the entire literature the author has not found one article which to his mind does justice to this problem. One of the main reasons for this shortcoming seems to be an attempt to lump all somatopsychic influences together regardless of the part of the body which is affected. In the author's own experience, the following emotional impacts of tuberculosis were observed:

1. Infectiousness: Emotional disturbances were observed in people from whom the disease had been transmitted to members of the family. In some cases the disease had actually caused the death of a wife or child. When the relationship with these relatives was poor, guilt feelings and symptoms resulted. The symptoms observed were anxiety states, as well as obsessive and compulsive rituals. One patient in such circumstances said, "I have a breath which kills." He was on the borderline of psychosis.

2. Patients who have hemorrhages or laryngeal tuberculosis with frequent attacks of glottic edema also tend to have a great deal of anxiety.

3. Patients who had anoxemia as a result of destruction of large portions of lung tissue sometimes developed schizophrenic-like symptoms. The author observed two patients who thought they were being poisoned by fumes and had other persecutory delusions.

4. Patients with a cough but without infection, especially with bronchiectasis, sometimes showed a tendency to withdraw from social contact for fear that other people would be afraid of them.

5. Persons with crippling bone or joint involvement reacted in a manner quite similar to that of the cerebral palsied or otherwise disabled person.

6. In many cases the reaction to thoracoplasty was just like the reaction to hysterectomy or mastectomy in others. Some patients with conflicts about sexuality had pronounced castration fear, and psychotic manifestations sometimes developed.

7. Two patients with tuberculoma of the brain had quite dissimilar reactions.

The foregoing are impressions gained from clinical experience. They are not based on statistical studies but they should be considered in any thorough study of the somatopsychic aspects of tuberculosis.

SOCIOPSYCHOLOGICAL ASPECTS

The patient's reaction to the disease is determined not only by his previous personality and by the type of lesion but also by the reaction to the disease of the people who are close to the patient. This, in turn, may be an important influence on the course of the illness. While working at the Los Angeles Sanatorium in Duarte, as well as in the Los Angeles City Health Department, the author was constantly impressed with the honesty of the husbands and wives of institutionalized patients. There were many extramarital affairs, but again and again the healthy spouse would come to the sanatorium and tell the patient about indiscretions. This candor may be attributed to an unconscious fear of the illness and looked upon as a defense mechanism. Fear of the disease by the relatives of tuberculous patients may therefore become an important sociopsychological influence. In some cases patients who had had negative cultures for a year or more were still denied close contact with a wife or child. Some of the patients thus shunned reacted with anxiety or withdrawal, or with overcompensation by reckless disobedience of all precautions, resulting in a flare-up of the illness. It is the author's belief that the underlying personality structure determines how a patient reacts to such a stress.

In another study of the psychosomatic aspects of tuberculosis it was found that the number of marital difficulties experienced by tuberculous persons just prior to hospitalization was higher than the number in a healthy control group. This was interpreted to mean that emotional difficulties such as the stress of marital tensions may precipitate tuberculosis. But another possible interpretation is that people who have tuberculosis without knowing it, but who feel tired and irritable, have a tendency to blame themselves or the closest persons to them for their unhappiness. Thus the marital difficulties may be the result rather than the cause of the illness. In turn, such troubles may aggravate the illness.

EUPHORIA IN TUBERCULOSIS

There has been a recurring statement in the literature that tuberculous patients are euphoric or that they react with a paradoxical cheerfulness and optimism to the serious illness. The author has observed release of tension in many patients immediately after diagnosis. This was noted in persons who had felt the load of the world on their shoulders, who had been so irritable that they had lost faith in themselves and others and for whom the diagnosis, which gave them an understanding of themselves, restored self-confidence and established faith in the physician who could understand and should therefore be able to cure. In later stages of the disease, euphoria is often simulated because a chronically ill person learns that he will be very much alone unless he can appear cheerful. In a very few cases true euphoria seems to be present.

MENTAL ILLNESS AND TUBERCULOSIS

There have been times when the high incidence of tuberculosis in mental illness was interpreted to mean that perhaps tuberculosis may cause mental illness, or that mental illness forms a strong predisposition to tuberculosis. In a study in New York, however, it was observed that in a certain county all the patients with newly diagnosed tuberculosis were physicians, nurses, and attendants who worked in the state mental hospital. This study seemed to indicate that in certain state hospitals there are poor hygienic conditions which facilitate the spread of tuberculosis to the personnel as well as to the patients. Since then it has been shown that in certain states such as Florida and New Mexico, where there are mental hospitals run on the open-air principle, the incidence of tuberculosis is no higher than in the average population.

In a very few cases, tuberculosis involving the brain or causing severe anoxemia of the brain may cause mental illness. Also in an individual predisposed toward mental illness, tuberculosis may be the stress which elicits it. As an example, a young woman in the sanatorium at Duarte became tuberculous shortly after her marriage. Her husband sued for annulment on the ground of fraud. The patient became schizophrenic, and before she was transferred to Patton State Hospital, she said that she had done a terrible thing, that her husband was right: She had actually married him in fraud; although she had not known she had tuberculosis, she had had a plastic operation on her nose which she had kept secret.

Close pointed out that there is no conclusive evidence that electric shock treatment reactivate tuberculosis. Furthermore, Close described a series of patients with active tuberculosis who had rapid, downhill course because mental illness interfered with treatment. All of these patients were helped through shock treatment.

DIET

The influence of emotions on diet and in turn the influence of diet on resistance has been pointed out in one article in which it was reported that fat and green vegetables were lacking in the diet of most persons who contracted tuberculosis. Attempt was made in the article to correlate the dietary deficiency with a specific personality structure.

EXPERIMENTAL WORK

Since neurosis can be produced experimentally in animals, the author looked for, but was unable to find, record of studies on the influence of experimental neurosis on resistance to tuberculosis as well as on the course of the illness.

(A complete bibliography is available from the author.)

Legislation Relating to Tuberculosis Control (Public Schools)

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THE Education Code (1949) of the State of California authorizes county boards of education to require candidates for positions to show evidence of freedom from active tuberculosis. The code reads in part as follows:

"*13031.1 Employment of Certificated Persons.*

"If required by an order of the County Board of Education, he shall also have on file with the county superintendent of schools a certificate from a physician and surgeon licensed under Chapter V of Division 2 of the Business and Professions Code showing that he has submitted to a physical examination within three years last past, including an x-ray of the lungs, and been found free from active tuberculosis."

(Added by Stats. 1947, Ch. 795; amended by Stats. 1949, Ch. 1162.)

"13031.2. In lieu of the certificate from a physician and surgeon required under Section 13031.1, any person who adheres to the faith or teachings of any well recognized religious sect, denomination, or organization, and in accordance with its creed, tenets, or principles, depends for healing upon prayer in the practice of religion, may file with the county superintendent of schools an affidavit stating such adherence and dependence and that to the best of his knowledge and belief he is free from active tuberculosis, and said affidavit shall be deemed equivalent of such certificate; provided, that if at any time there should be probable cause to believe that such affiant is afflicted with active tuberculosis, he may be excluded from service until the governing board of the employing district is satisfied that he is not so afflicted."

(Added by Stats. 1949, Ch. 1162.)

"*Employees of School Districts Other than Persons Requiring Certification Qualifications.*

"14002.1. No person shall be employed by a school district in a position not requiring certification qualifications which requires him to be in frequent or prolonged contact with pupils until, if

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required by an order of a County Board of Education, he has on file with the county superintendent of schools a certificate from a physician and surgeon licensed under Chapter V, of Division 2, of the Business and Professions Code showing that he has submitted to a physical examination within three years last past, including an x-ray of the lungs, and that the results of such examination indicate that he is free of active tuberculosis."

(Added by Stats. 1949, Ch. 287.)

"14002.2. In lieu of the certificate from a physician and surgeon required under section 14002.1, any person who adheres to the faith or teachings of any well recognized religious sect, denomination, or organization, and in accordance with its creed, tenets, or principles, depends for healing upon prayer in the practice of religion, may file with the county superintendent of schools an affidavit stating such adherence and dependence and that to the best of his knowledge and belief he is free from active tuberculosis, and said affidavit shall be deemed equivalent of such certificate; provided, that if at any time there should be probable cause to believe that such affiant is afflicted with active tuberculosis, he may be excluded from service until the governing board of the employing district is satisfied that he is not so afflicted."

(Added by Stats. 1949, Ch. 287; amended by Stats. 1949, Ch. 1162.)

EXPERIENCE IN THE SAN DIEGO CITY SCHOOLS

Chest x-rays have been required for many years as part of third year probationary teacher examinations. This was accepted as a normal and important part of the evidence that would qualify a teacher for permanency.

More recently, chest x-rays have been required as part of the physical examination of all teacher candidates prior to employment. This, then, provides chest x-rays prior to entrance and again after three years.

It is generally agreed that people working closely with children should have chest x-rays at least every three years. Subscribing to this belief, the San Diego Board of Education made it mandatory for all school employees (certificated and classified) to have chest x-rays every three years.

It was planned that the requirement of the periodic three-year chest x-rays coincide with the Metropolitan Mass Chest X-Ray Survey sponsored by the Department of Public Health. By working closely with the health department and the survey, all school employees had their first periodic chest x-ray. In 1952, all school employees will again have chest x-rays or photofluorographs. This will continue every three years thereafter.

As of October 1, 1949, persons depending upon prayer for healing are exempt from chest x-rays in California (Sections 13031.2 and 14002.2 of the Educational Code). Those claiming exemption on a religious basis were required to sign and have notarized an affidavit of their adherence to the principles upon which claim of exemption is based. About 1 per cent of the school employees signed these affidavits. It is agreed, however, that a member of such faith may be excluded from service if at any time there is probable cause to believe that he is afflicted with active tuberculosis.

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Unpredictable Anatomic and Physiological Factors in the Treatment of Diseases of the Lungs

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VARIATIONS in anatomic structure and arrangement and abnormal development of tissues or parts occur not infrequently in the lungs and pleura. Disturbances of physiological functions in the bronchi, air cells, arteries, veins, lymphatics, or nerves of the lungs or pleura do result from the presence of disease. Such disturbances vary greatly in different patients with apparently similar disease and offer unpredictable circumstances and hazards in the treatment of the case.

The embryologic development of the lung and bronchi may hold the answer of later disease. At birth the lungs are in fetal state with alveoli uninflated and bronchi partially patent. It is to be remembered that some alveoli may and do remain uninflated for a variable time after birth. It has been estimated that areas of fetal lung may exist in an individual up to 12 or 14 years of age. Some alveoli may, by developmental mishap, never inflate. Some areas of lung may fill out and later recollapse. Certain bronchi may not follow the normal growth of the rest of the lung, or may be impeded in their development by enlarged lymph nodes leading to atresia. Such disturbances of development afford the set-up for later predestined bronchiectasis or cystic disease.

The size of bronchus where cartilage is lost also marks the level where the smooth muscle in the wall changes in distribution from regular bands to scattered fibers. Smooth muscle in the bronchi is a microscopic study, but loud and emphatic in clinical assertion. Listen only to the wheeze and stridor, or watch the physical struggle of an asthmatic patient, and then ask where is smooth muscle and how does it act. Normally designed to function for the protection of the air cells, the terminal band of this smooth muscle, encircling like a sphincter the opening of the atria, can be thrown into such contraction as to produce internal suffocation.

Interference of normal drainage of the bronchi with resulting stagnation of secretions and weakening of the wall leads to dilatation. The earliest evidence of such bronchiectasis is detected and described as small herniations of the mucosa between the strands of smooth muscle and scattered pieces of cartilage. The most frequent site of such early bronchial dilatation is the long lingual tip of the left upper lobe, a bronchus with normally poor drainage because of its shape and length. The significance of bronchiectasis complicating other chronic lung diseases is extremely important. Almost invariably it accompanies long-standing chronic fibroid pulmonary tuberculosis. It is in such cases that the earliest evidence of dilatation in the lingual tip bronchus is most frequently noted at autopsy. Patients in whom the condition exists may continue to have cough and expectoration with bloody sputum and even hemorrhage long after the tuberculous lesions are fully arrested. These symptoms are the result of the accompanying bronchiectasis. It challenges the acumen of the finest clinician to distinguish between this cough, sputum, and blood which the patient may continue to have, and the same symptoms which the patient presented when the tuberculosis was active.

The lungs are, no doubt, submitted to as much insult from environments of living as any other organs, possibly more. The cilia of the trachea and bronchi do much in protection. In the finer bronchi this is lost, and the columnar epithelium changes through the transitions from cuboid to flat squamous continuous single layered epithelium of the alveoli. Spaces or pores between the lining epithelial cells of the alveoli would permit of ready contiguous spread of serum or cells from one alveolus to another. Thoughts regarding pneumonia, edema, or even normal physiology in the lungs would be influenced by such a concept. It is proven they do not exist.

The total number of alveoli in the lungs is estimated to be 750,000,000. The surface of the lining membrane of all the alveoli is estimated to be about 800 square feet.

Most important of all protective mechanisms for the lungs are the lymphatics. Most valuable of all anatomic descriptions for use in study of diseases of the lungs is that of the lymphoid tissue, the lymphatics, and the circulation of the lymph.

The size, position, and structure of lymph masses at hilum and along the bronchi permit proper interpretation of the shadows produced by them on chest roentgenograms. The absence of lymphoid tissue and lymphatics beyond the ductuli alveolares pulmones forces one to include in any concept of pathologic changes the part played by the wandering phagocyte. If one views this cell, laden with coal pigment, bearing its load to depots of lymphoid tissue for deposit in cases of anthracosis, the action of phagocytosis is seen. These same cells can and do grab bacteria such as tubercle bacilli and conduct them to the realm of the lymphatics. Tubercle bacilli so engulfed in the cell can be stained and recognized. The phagocyte can carry this organism but not destroy it. It remains for the lymphoid cells to attempt this destruction.

The understanding of normal lymph flow from the parenchyma of the lung to the hilum lymph nodes gives rise to the concept that infection does not spread from the hilum out into the lungs, but

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from the lungs to the hilum. The placement of valves in the septa at the pleura, with the consequent area of drainage toward the pleura, explains the open pathway permitting of infection passing from the lung beneath the pleura to this membrane. The presence of valves opening toward the hilum in the inner third of the lung makes obstruction of flow in this area give rise to the peculiar clinical picture of lymph stasis and edema localized to the inner third zone of the organ. The characteristic roentgenogram of symmetrical bilateral butterfly-like pattern in the central lung fields in cases of uremia is a striking example of this condition. The pathognomonic roentgenogram findings of a Ghon in the parenchyma of the lung, the heavy trunk marking leading to the hilum and the calcified lymph node in the hilum are mute evidence of primary type tuberculous infection and the residual permanent localized scars wrought in the lymphatic system of the lung by Koch's phenomenon in the human. If the presence and position of lymphoid tissue in the chest is borne in mind, the clinical pictures of lymphoblastoma, Hodgkin's disease and leukemia will be simplified.

Anatomic studies by injections of blood vessels, serial microscopic sections, wax models, and corrosion specimens have shown that the pulmonary artery closely accompanies the bronchus in all of its divisions. It lies posteriorly and slightly lateral to the bronchus. Engorgement or thickening of the arteries results in widening of the trunk markings on the roentgenograms. More and more, investigators are appreciating the importance of sclerosis of the pulmonary arteries in emphysema, chronic lung inflammation, silicosis, cor pulmonale, Ayerza's disease, and any means to help in its recognition is welcomed. The enlargement of the pulmonary conus or arteries at the hilum may determine clinical diagnosis of cardiac disease or disturbed pulmonary circulation. The position of the pulmonary artery close to the bronchus helps to explain the comparatively rare finding of Rasmussen's aneurysm in the wall of a cavity. This condition develops when the artery approaches the wall of the cavity tangentially. The discovery of this rupture at autopsy has established the cause of death by hemorrhage in several cases. The bronchial arteries, a part of the general systemic arterial system, occupy no secondary place in clinical considerations. Hemorrhages in bronchiectasis are often most profuse, persistent, and hard to control. The bleeding is from the bronchial artery. This vessel is embedded in the rigid cartilaginous wall of the bronchus and is less apt to contract and be closed. It is a part of the general systemic circulation where the pressure is higher than in the pulmonary circuit. There are few bronchial veins. The nutrient blood supply is returned almost entirely by the pulmonary veins. Anastomosis between the bronchial and pulmonary arterial systems does occur and has been demonstrated. The remainder of the bronchial arterial system makes it possible to explain paradoxical emboli and infarcts in the lungs and interstitial hematogenic chronic miliary tuberculosis, a condition which is being observed more frequently in clinical studies and at the autopsy table.

By careful injections of both bronchial and pulmonary arterial systems it has been shown that the distal portion of the divisions of the bronchi, namely the ductuli alveolares pulmonis and air spaces beyond, receive their nutrient supply from the pulmonary vessels. In these distal areas there is union of capillaries formed from the bronchial and pulmonary arteries. Tubercle bacilli seeded into the lung by hematogenic route are particularly prone to lodge here and form lesions. The keen observation of the fact that the bronchial arteries in the human and guinea-pig supplied the lymphoid tissue in the lung, but that in the rabbit the lymphoid tissue gained its nutrient blood supply from the pulmonary artery, led to the explanation and correct interpretation of critical series of animal experiments.

The surface of the capillary bed overlying the alveoli is estimated to be about 1,000 square feet. The total volume of blood pumped through the lungs at rest is estimated at four liters per minute. This can be increased to 30 liters with exercise.

Elastic fibers branch and anastomose. They form networks which are capable of stretching and resuming their normal size and position. Elastic fibers are recognized in sputum and, when so found, give evidence of destruction of lung tissue. These fibers can be demonstrated in tissue slides by special stains and then show beautifully the part played by them in the architecture of the organ. The walls of the alveoli are abundantly supplied with these elastic fibers. Sections of lung tissue stained especially for the elastic fibers, leaving out cells and the other connective tissue, show a honeycomb-like framework of the sacculi and alveoli. In normal respiration these air cells and also the bronchi expand and contract. In emphysema the air cells become overdistended. The framework of the sacculi and alveoli is stretched. When the emphysema is severe and general throughout both lungs, the organs are enlarged, and the chest cavity in turn is increased in size. This leads to the clinical picture of the deep-chested, stooped, cyanotic, distressed patient, struggling to force air out of the overdistended air cells where rapid exchange of gases is so imperative. Under the microscope the alveoli may be seen to become more and more stretched, pulling and elongating the elastic fibers in their framework. Finally, the stretching is overdone, elastic fibers snap, walls give way and bullae of large spaces form. These bullae in the lung may reach proportions in size so as to be mistaken for cavities on chest roentgenograms. But more interesting is the phenomenon of interstitial emphysema. In such cases the stretching of air cells, snapping of elastic fibers and separation of cells lead to rupture of the continuous lining membrane and escape of air into the interstitial connective tissue of the lung. This air dissects its way

along the bronchi or blood vessels toward the hilus and may make its appearance in mediastinum, neck, or soft tissues over the chest wall. The clinical picture is sometimes difficult to recognize but, when detected, is striking in its signs. The patient is stricken with sudden pain in the chest and then becomes either short of breath or aware of a peculiar distress with respirations. The physical examination at first may show nothing. But later moving, crackling, firm bubbles of air may be felt under the skin of the neck or upper chest wall. More startling is the detection of the air bubbles in the mediastinum or lung framework by the crunching, crackling sound of eggshells breaking synchronous with the heart beat. This tells of air let loose in the connective tissues by rupture of the limiting membranes of epithelium and elastic fibers.

The visceral pleura consists of four layers, named from the outer to the inner in order, mesothelial, submesothelial, elastica externa and areolar. The elastic layer stands out in properly stained tissue sections as one of definite compact fibers. Another layer of elastic fibers, called elastica interna, just above the alveoli, has been described. Tissue sections show that these internal elastic fibers belong not to the pleura but properly to the alveoli. The fibers are continuous and anastomose with those in the walls of the underlying air cells. Rupture of these elastic fibers joining outer alveoli and pleura also occurs in emphysema. The escaped air dissects outward in the pleura, invading the areolar layer and separating the membrane from the lung surface. This leads to the formation of blebs which may reach enormous size and lead to confusion with cavities or cysts in the lungs. Hard to explain is the fact that an entire lobe may be honeycombed with cavitation, or reduced to a single large sac with destruction of all lung structure, and the pleura remain intact. On the other hand, spontaneous pneumothorax suddenly occurs, and there may be no demonstrable lung lesion or at the most some emphysema. A logical thought of reasoning is that, in the former case, the inflammatory process waging destruction in the lung is resisted and held in check in the pleura by the efficient defense of elaborate lymphatic drainage plus the natural toughness of the membrane. In the latter case, an anatomic weakness inherent in the structure of areolar layer and elastic fibers permits of sudden rupture with overdistention of the air cells. The disabling factor of emphysema does not remain confined to the faulty air flow into and out of overdistended air cells. The tiny pulmonary arterioles compressed between the enlarged sacculi become thickened and sclerosed to a degree sufficient to damage and embarrass the right side of the heart. Emphysema, pulmonary sclerosis, chronic cor pulmonale are factors and progressive events which must be seriously reckoned with in judging disability, prognosis, or advisability of surgical measures in chronic lung infections.

Septa are prolongations of the areolar fibrous tissue of the pleura extending into the lung and dividing it into the arbitrary units of secondary lobules. The structures of these septa, compact with areolar tissue and containing elastic fibers with blood and lymphatic vessels embedded in them, makes them comparable to the resistant layer of the pleura. Their resistance to the progress of inflammation by contiguous spread is similar to, but not as great as, that offered by the pleura. Exudate of early pulmonary tuberculosis will be stopped by the septa, accounting for the sharply localized physical signs and characteristic densities as seen on chest roentgenograms. But ulceration and cavitation in their destructive extension break down and through the septa. Any extension of cells into the lung tissue, be it tuberculous process, acute lobular pneumonia or infarct, can be localized and confined by these connective tissue barriers. The triangular lesions of an infarct viewed grossly or microscopically in a section of lung or limited by the septa. Likewise, it is not unusual to see areas of severe emphysema or a bulla stopped by these same fencelike bars. New growths in the lung, on the other hand, are little impeded in their relentless contiguous growth and move on to whorls and nodules in size, outreaching the confines of the secondary lobules. There is another interesting phenomenon observed grossly at the postmortem table which illustrates vividly the lymph flow in the septa. Areas showing enlarged full lymphatic vessels will be seen in the pleura. If a cut into the lung is made immediately under this spot, a fibrous lesion will be found, perhaps not even reaching to the pleura, but placed in the midzone of the lobe. Microscopic studies will show that the normal lymph flow from the midzone of the lung toward the hilus has been obstructed by distortion of the septum with scar tissue forcing more than the normal amount of flow of lymph to the pleura in this area. The valves placed in the lymphatics at the junction of the septum and pleura open toward the pleura.

The nerve supply of the lungs is from two sources; namely, the vagi and the sympathetic nerves. The completed picture of their distribution is still forthcoming. Ganglia occur along the nerve fibrils in the bronchi and blood vessels, and special end organs are placed in smooth muscle fibers. Microscopic studies made in cases of emphysema and chronic bronchial infection show infiltration of the tissues by the telltale eosinophils of asthma. and strikingly the ganglia themselves are invaded. Seldom does one stop to consider why it is that a lung may be partially or completely destroyed by tuberculosis, abscess or new growth, yet the patient have no pain. On the other hand, localized beginning pleurisy causes excruciating pain. A patient with both lungs full of metastatic carcinoma may be comfortable and free of pain, while another struck by pulmonary embolus with a small lesion in the lung in the lung capped by localized pleurisy may suffer greatly. The lungs have no pain nerves; the pleura is rich with them.

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Cavernostomy

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SUMMARY

A brief historical review of cavernostomy is presented. The mechanics of cavity closure are considered.

A follow-up of the first seven cases of cavernostomy performed by the authors in 1940-41 with the use of a skin flap is given.

Cavernostomy is a procedure useful at times, but within sharp limitations.

FEW diseases are so varied in pathological anatomy as is pulmonary tuberculosis. Because of this, many avenues of attack have been developed over the years in the effort to cure or arrest this disease. Some procedures of wide applicability have stood the test of time, and their use and indication are widely understood. Examples of these are artificial pneumothorax, pneumoperitoneum, and apical thoracoplasty. Other methods of attack of more limited use, but at times most effective, are Monaldi suction, cavernostomy, extrapleural plombage, etc.

Cavernostomy as a procedure in treating tuberculosis is far from a new procedure, but the early results were often disappointing. Lilienthal in 1927 described an open drainage of a secondarily infected cavity which had blocked off following thoracoplasty. Nissen in 1931 reported a successful drainage of a large anterior apical cavity following an attempt at plombage. Eloesser in 1925 drained a cavity under a thoracoplasty and the patient was said to be well when last followed up in 1935. In 1929 Lilienthal gave the following indications for direct drainage of a tuberculous pulmonary cavity:

1. Virulent mixed infection with clinical signs of pulmonary abscess.

2. Inability to obtain cavity collapse without great danger to life, plus the presence of so much sputum that bronchogenic spread was a constant threat.

Lilienthal again mentioned this subject in 1931, and at that time he recommended the use of a muscle flap to obliterate the residual cavity. The results were not entirely successful.

It was not until Eloesser published his classical work on bronchial stenosis especially as it relates to tuberculosis, and Coryllos and Ornstein pointed the way toward the understanding of the pathological physiology and anatomy of cavitation that a rational use of the operation of cavernostomy was evolved. This depends upon the recognition of two factors in tuberculosis cavitation: (1) the "intrinsic" or bronchial factor leading to the one-way valve and consequent high intracavitary pressure and (2) the "extrinsic" or chest wall factor which operates by adhesions to keep the cavity open as long as the chest wall maintains its normal position.

The usual apical thoracoplasty served to close a majority of tuberculous cavities by eliminating the extrinsic factor, but in a small percentage of cases the cavity refused to close or actually became larger because of the uncontrolled intrinsic factor. It was for such cases that Shipman, Rogers and Daniels in 1941 introduced a skin flap cavernostomy for the release of the high intracavitary pressure which had kept the cavity insufflated.

Seven cases were reported at the time, five in which the sputum became negative for tubercle bacilli and two in which the operation had been only recently performed and the sputum was still "positive." A nine- to ten-year follow-up is presented below:

Case 1: A man 29 years of age had onset of right-sided pleurisy with effusion in 1937 followed in 1938 by right upper lobe cavitation unsuccessfully controlled by pneumothorax, followed by seven-rib thoracoplasty in December 1938 and January 1939. Intracavitary pressure in April 1939 varied from plus 20 to plus 12 cm. of water. Flap operation was performed August 1, 1939. The sputum became negative for tubercle bacilli shortly after the operation and the flap closed in January 1940. The patient resumed the practice of denistry in September 1940 and has remained well since.

Case 2: A female, aged 19, had onset of tuberculosis in September 1938 with a large cavity in the left upper lobe controlled by pneumothorax and extrapleural pneumothorax. A six-rib thoracoplasty in January 1940 failed to close the cavity and bronchoscopy revealed moderate stenosis of the left stem bronchus. Cavernostomy was carried out September 27, 1940, and there was spontaneous closure in June 1941. The patient remained well until January 1943 when spread to the left base developed. It was controlled by completing thoracoplasty. The patient is now well and at work.

Case 3: A female 31 years of age had onset of disease in January 1940. It was controlled by apical thoracoplasty performed in October and November 1940. A flap operation was done September 25, 1941, and there is no record of tubercle bacilli in the sputum since that time. The patient is well and at work.

Case 4: A 24-year-old woman had onset of tuberculosis in 1938. Bed rest was continued until left apical thoracoplasty was done in March and August 1940. The cavity appeared to close, then was found to be open. Flap drainage was carried out November 29, 1940, with spontaneous closure December 30, 1941. Smears from the sinus tract were negative for tubercle bacilli in August 1941. Sputum has been negative for the organism since November 1942.

Case 5: A female 42 years of age had onset of tuberculosis in 1938. It was not controlled with right-sided thoracoplasty. Cavity drainage was done October 25, 1940, with apparent

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closure of the cavity in several months. The lesions reopened and a second cavity drainage was carried out in September 1941. The course then was gradually downhill and the patient died in 1942.

Two patients died of tuberculous meningitis within several months after the flap operation was done. Thus of the seven reported patients on whom the flap operation was done in 1941, four are alive, well and at work, and three are dead.

An extended report will be made later reviewing nine subsequent cases to date. In one of these, two flap operations on two separate cavities were done simultaneously. None of this group have died. Four have sputum free of tubercle bacilli and are apparently well, and one is clinically well but has an occasional "positive" sputum. In the remainder the disease is still active.

Since the presentation of this type of cavernostomy in 1941 the authors' attitude toward the operation and the indications for its use have been influenced by the use of antibiotics and the increasing incidence of resection of diseased lung. At present it is felt that cavernostomy is indicated in cases in which any of the following conditions is present:

1. An unclosed cavity beneath an adequate thoracoplasty in a patient not otherwise suitable for a resection of the collapsed lobe or lung.

2. A cavity so situated in the lung that attempted closure by thoracoplasty will destroy excessive amounts of functioning healthy lung tissue and one which cannot be controlled by more conservative means such as phrenic crush and/or pneumoperitoneum in a patient not otherwise suitable for a resection procedure.

3. A cavity which is producing such abundant sputum that bronchiogenic spread is continually threatened in a patient not suitable for resection, thoracoplasty or other collapse procedure.

Cavernostomy with the use of a skin flap may be done as a one-stage operation, but the authors prefer two stages. The first stage consists of formation of the skin flap, resection of one or two ribs and the intercostal bundle overlying the cavity, and suturing of the flap to the pleura. The wound is then packed with dry or vaseline gauze. The second stage is done one or two weeks later after the skin flap has become well attached to the underlying tissue. This stage can be easily done without anesthesia and the cavity unroofed. No packing is used subsequently, although antibiotics or chemotherapeutic agents may be introduced locally. The one-stage operation has the disadvantage that the skin flap often does not "take" as a graft into the cavity, and it is then extruded. The use of streptomycin before and after a one-stage operation may result in a good "take" of the flap.

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Upper Lobe Lobectomy and Concomitant Thoracoplasty in Pulmonary Tuberculosis

A Preliminary Report

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SUMMARY

In this, a preliminary report, the advantages and disadvantages of upper lobe lobectomy and concomitant thoracoplasty in tuberculosis have been summarized. There has been no undue increase in the operative hazard, there have been no complications, and the immediate results have been entirely satisfactory.

Twenty-six patients were subjected to a combined operation (17 upper lobectomy-thoracoplasty and nine pneumonectomy-thoracoplasty) with one postoperative death.

Indications for primary lobectomy have been discussed.

The technique of resection and concomitant thoracoplasty has been briefly described.

THERE is general agreement that hyperexpansion of remaining pulmonary tissue following resection in tuberculosis is undesirable. In many cases, thoracoplasty stages have been performed to prevent such overdistention, usually several weeks following upper lobe resection or pneumonectomy. This is but one example of the well established principle in thoracic surgery that multi-staged operative procedures frequently are employed to reduce surgical risk. If, however, two procedures can be performed at one time and at a risk not beyond the additive hazard of multi-staged operations, certain advantages will accrue.

In February 1949 Iverson and Skinner[3] reported success in performing pneumonectomy and thoracoplasty at a single operation. During the past year the authors' particular interest has been directed at upper lobe lobectomy and concomitant thoracoplasty although they have performed pneumonectomy-thoracoplasty combinations as well. Up to February 15, 1950, a total of 26 combined operations was performed with one postoperative death (3.8 per cent). In 17 of the patients, a combination of upper lobe lobectomy and thoracoplasty was performed and in nine, pneumonectomy and thoracoplasty. In the latter group, one of the resections was performed for carcinoma, one for multiple abscesses and one for post-traumatic bronchial obstruction. It may be mentioned in passing that pneumonectomy-thoracoplasty apparently is not well tolerated by elderly persons. In two such patients the postoperative course was considerably complicated by the fact that the patients were not able to raise sputum satisfactorily.

The following discussion will be primarily concerned with upper lobe lobectomy and concomitant thoracoplasty. All patients in whom lobectomy was performed had had at least one sputum positive for acid-fast bacilli but in two patients (both of whom showed extensive pyogenic suppuration) active tuberculosis could not be definitely proved in the resected specimen.

In assessing a new procedure, both advantages and disadvantages should be weighed with care. The main objection is based on at least partially theoretical grounds that there will be an appreciable increase in operative hazard. Both Alexander[1] and Kent[4] have doubted the wisdom of the "compounding" of operations as probably leading to a greater surgical mortality. To date, this has not been borne out in the authors' experience. Another objection that has been raised is that concomitant major procedures will unduly increase the length of operation. This has been carefully measured: The thoracoplasty as described later in this presentation has increased the operating time an average of only 16 minutes.

The advantages concern both the disease process and the patient. The main tuberculous focus which is spilling bacilli is ablated at once. In the majority of instances, there is evidence of disease in the remaining lobe or lobes, not infrequently in the superior segment of the lower lobe. If any segment contains a cavity or a soft, presumably active lesion, a segmental resection usually is performed in conjunction with the lobectomy; but often it is impossible to remove all the palpable disease. The immediate addition of thoracoplasty prevents even short-term overexpansion of the remaining lobe. Another advantage concerns the possible preservation of vital capacity. While facilities are lacking to substantiate this belief, it is the authors' impression that there is less reduction in the vital capacity following lobectomy-thoracoplasty than with a thoracoplasty which

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would have been sufficient to control the disease. If this assumption can be proved, it will then be possible to consider bilateral resections and thoracoplasty in suitable cases.

The patient is concerned with but a single major procedure. This has a definite psychological value and may be extremely important economically. The deformity is less than with either thoracoplasty and subsequent lobectomy or lobectomy followed in some weeks by thoracoplasty—unless, in the latter instance, the first rib is not removed.

STATUS OF PATIENTS PRIOR TO OPERATION

The patients in the group here reported upon were presented for consideration of major surgical treatment under fairly uniform conditions. Only one was over 50 years of age. All but one were considered excellent operative risks. Although nearly one-half had had bilateral active tuberculosis originally, only three were considered to have active stable contralateral disease at the time of operation. Here, it is well to stress the importance of using a right angle telescope for thorough evaluation of the condition of upper lobe bronchi. In all patients, the disease was chronic; all had benefited on a non-surgical collapse regimen and sanatorium care. In all cases the bacilli were sensitive to streptomycin and this drug was given prophylactically. More recently, both streptomycin and para-aminosalicylic acid (PAS) have been used prior to operation: Streptomycin, 1 gm. daily for approximately seven days; PAS, 12 gm. daily for approximately 28 days.

INDICATIONS FOR OPERATION

In any clinic where an appreciable number of resections are performed, there are well known difficulties in attempting uniformly to decide what constitutes an indication for primary lobectomy. The success or failure of the surgeon with both lobectomy and thoracoplasty (including his most recent case), varying conservative or radical attitudes of the medical consultant, the individual interpretation of roentgen films in regard to actual pulmonary pathologic changes, the general status of the patient, and the bronchoscopic findings are all factors which need but to be listed. There is likewise growing realization that thoracoplasty may not be the ideal operation for all chronic tuberculosis; that thoracoplasty results differ considerably if the type of pulmonary pathologic changes is taken into consideration. The recent report of Rubin and Klopstock[5] and Steele's[6] editorial mirror this belief in an excellent manner.

With these facts in mind, histories, films and bronchoscopic findings of the 17 patients who had lobectomy-thoracoplasty were impartially reviewed. Ten patients were considered to have indications for primary lobectomy, with one or several of the following: Tension cavities, solid lesions (tuberculomas or inspissated cavities); secondary pyogenic infection (abscess or clinical bronchiectasis); lobar or segmental bronchial stenosis. Not only the type but the position of a cavity is of appreciable importance. There is general agreement that cavities well forward in the anterior segments of the upper lobe, in the middle lobe or in the lingula are difficult to close with thoracoplasty. On further review of the surgical pathology, it was noted that five of the seven patients considered to be candidates for elective resection had varying combinations of thick-walled cavities, pronounced bronchiectasis, extensive intrapulmonary tuberculous bronchitis, fibrosis, and lobar distortion. These are types of disease, Rubin pointed out, which respond poorly to thoracoplasty.

OPERATIVE PROCEDURE

It is stressed that the operation to be undertaken is lobectomy. Thoracoplasty is done after the lobectomy is completed only if the patient is in satisfactory condition at the end of resection. The authors are opposed to thoracoplasty first, then lobectomy. All the operations were done with the patient in the lateral recumbent position with the upper arm retracted well forward and cephalad. The incision was somewhat longer than that for the usual lobectomy. It was commenced halfway between scapula and spine, opposite the second transverse process, hooked slightly around the inferior angle of the scapula and then carried anteriorly along the fifth rib to the midclavicular line. The muscles were divided in the usual manner in the line of the incision. (Brock's[2] musculoplastic incision does not make the operation easier or faster, nor does it decrease the blood loss.) A greater part of the fifth rib was resected extending laterally from the transverse process. The upper lobe was removed by the accepted individual ligation technique. (Additional segmental resections may be performed if indicated. Decortication likewise may be necessary.) The remaining lobe or lobes were freed from binding adhesions and from the diaphragm to permit adequate and rapid expansion. All air leaks were closed.

When that had been accomplished, consultation was held with the anesthesiologist and the condition of the patient was carefully reviewed. If the situation was satisfactory, extrapleural thoracoplasty was carried out by removing segments of the fourth, third, and second ribs approximately as follows: The fourth rib to the anterior axillary line; the third to the midclavicular line and the second to the midclavicular line or to the cartilage. The periosteum was then peeled from the under surface of the first rib and the parietal pleura was separated from the inner edge and dropped from the cupola of the thorax by extrapleural separation to a plane roughly paralleling the first sternochondral junction. (This maneuver is believed to be of considerable importance in limiting the cephalad expansion of the remaining lobes.) Right angle tubes were placed in the second interspace anteriorly and in the eighth interspace posteriorly. These were immediately connected with water trap bottles and every effort was made for prompt reexpansion during postoperative bronchoscopy. The posterior tube was then clamped and a solution containing 500,000 units of penicillin and 1 gm. of streptomycin was placed in the ante-

rior tube for approximately four hours. The posterior tube was then opened. The immediate postoperative care did not differ from that of any lobectomized patient and will not be discussed in detail. In general, streptomycin was continued for at least two weeks and PAS for from one to four months postoperatively, the period depending upon visible remaining disease. In those cases in which there was or had been recent active disease, pneumoperitoneum usually was established within ten days of the lobectomy.

The follow-up care is of the utmost importance. No resection removes all of the tuberculous infection. Strict bed rest for a period of six months following operation is advisable as a rule, although in several cases, where the disease was apparently highly localized to the lobe removed, patients were allowed to commence carefully graded activities three months after operation.

IMMEDIATE RESULTS

One patient in the series died. That patient was considered to be only a fair operative risk. The upper lobe was completely excavated and the size of the cavity had not diminished after four months of Monaldi suction. There were clinical evidences of low-grade toxicity and the patient did not gain weight although cough was somewhat reduced following insertion of the catheter. As it happened, the death was preventable. Insufficient nursing coverage the night of operation resulted in rapid deterioration and shock from anoxia due to plugging of the right stem bronchus and lower trachea. At autopsy, atelectasis on the operative side and extensive tuberculous pelvic peritonitis were noted.

Of the 16 surviving patients, eight were operated upon six months or more before the time of this report. Of these, four had had sputum negative for acid-fast bacilli on repeated concentrate and culture examinations for four months or longer and were on graded exercise. The remaining four have been discharged from the sanatorium.

Of the entire group of 26 patients with combined resection and thoracoplasty there was no wound infection, no empyema, and no spread or reactivation of tuberculosis. In three cases in which it was presumed that active tuberculosis was still present on the contralateral side, there has been steady regression of the lesions.

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Pleural Decortication in Tuberculosis

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SINCE the report on decortication in tuberculous empyema by Frazer Gurd in 1947, there has been a fair experience with application of the method by a number of clinics. Twenty operations of total pleural decortication in tuberculous pleuritis have been done at Birmingham Veterans Administration Hospital since the fall of 1947, and enough time has now elapsed to permit an appraisal of the procedure insofar as the indications for operation and the early results are concerned.

In the 20 cases in which the operation was done the etiologic background was: Induced pneumothorax, ten cases; spontaneous effusion, four cases; induced pneumothorax followed by spontaneous pneumothorax, one case; pneumothorax and pneumonolysis, five cases.

The indications for operation were: Unexpanded lung with clear fluid, eight cases; undrained frank empyema, 11 cases; draining empyema, one case. In three of the cases of undrained empyema there were relatively small, almost silent abscesses with a greatly thickened fibroid surrounding membrane. The condition in these three cases was the result of spontaneous pleural effusion during the course of pulmonary tuberculosis, and the condition had existed for at least six months prior to admission to Birmingham Veterans Administration Hospital.

Reexpansion had been attempted in all of the cases at some period prior to operation. In each case there was ample evidence that the space could not be obliterated by medical means, or that if obliteration could be accomplished, it would be done at the expense of extreme shifting of the mediastinum, which had occurred in three cases. Surprisingly, an accumulation of tuberculous pus was found in each of these three cases.

One cause of concern which is frequently expressed is that the underlying lung may harbor cavities or other tuberculous lesions which are obscured by the empyemic sac, and that reexpansion

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of the lung following decortication will aggravate the pulmonary tuberculosis. This was not found to be the case in this series. The compression of the lung by the empyema or pleural thickening does not appear to benefit the underlying diseased lung. As one would expect, the removal of the empyemic sac benefits the patient by removing a source of toxic absorption which is usually more serious than the lesions within the parenchyma. This has been borne out by the uniform improvement in the general condition of patients following decortication. Furthermore, the lesions within the lung may be recognized at the time of and following decortication, and may be treated in a purposeful manner, including compression therapy when it is indicated. Four of the patients had thoracoplasty at the time of decortication or a few weeks later, in two instances to compress an underlying lesion, and in two to bring the thoracic wall to the lung because the lung did not expand completely.

All of the patients are alive, and the empyema or abnormal space has been obliterated in all of the patients, except one among those most recently operated upon. This patient, one of three operated upon within two months of the time of this report, had an accumulation of purulent fluid and it was considered that removal by drainage might be necessary. The latest three cases deserve special mention because they are the only cases, in the group of 20, in which operation was done without the adjunctive use of streptomycin. In all three cases fluid formed following operation. In one case—that of the patient with accumulation of fluid at the time of this report—the fluid at first was evacuated spontaneously through a previous surgical wound made for immediate aspiration following operation. In another case in this group of three, purulent exudate developed three weeks following operation. The surgical wound is now closed and there is no evidence of retained fluid. In the only other case in which fluid developed following operation, the organism was resistant to streptomycin at the time of operation. Complete obliteration of the space followed spontaneous evacuation of the fluid one month after operation, and the patient has remained well since. Thus the three cases in which streptomycin was not used at the time of operation are the only ones in which complications of any serious significance developed.

In the author's experience, there have been few contraindications to decortication. In the case of unexpanded lung without suppuration, enough time and effort must be given to attempts to reexpand the lung by medical means before decortication is decided upon. However, once it is ascertained that the lung will not fill the pleural space without dangerous shifting of the mediastinal structures, decortication should be performed early, since the longer the abnormal space remains, the more difficult it will be to reexpand the lung.

One should hesitate to perform decortication in the presence of active disease of appreciable extent in the opposite lung. In the cases in this series in which there was controlled disease in the opposite lung, there was no evidence of spread following operation. In these several cases the organisms were sensitive to streptomycin. In one case, a cavity in the opposite lung was treated by thoracoplasty several weeks following decortication. The decortication was done first in order to permit reexpansion of the lung prior to compression of the opposite lung by thoracoplasty.

The author's experience with decortication has been very satisfactory. There was no operative or subsequent mortality and the space was obliterated in all cases. This is in contrast to the general experience with other methods of treatment, both surgical and non-surgical, in which the empyema patient undergoes numerous mutilating operations, often without success, or is treated by aspirations over periods of years.

The fact that 15 of the 20 patients have been followed for from one to two and one-half years and have no evidence of recurrence of the empyema or abnormal space or evidence of pulmonary spread is fairly good assurance that the disease for which the operation was performed will not recur.

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The Early Use of Surgical Procedures in the Treatment of Pulmonary Tuberculosis

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CHOICE of procedures for the treatment of pulmonary tuberculosis has undergone considerable change in the past ten years. Rather than more radical, treatment has actually become more conservative, less meddlesome and more effective than it was ten years ago.

The type of therapy for pulmonary tuberculosis is dependent frequently upon the particular geographical area in which the patient happens to seek treatment and often varies considerably a few miles on either side of a state line.

In 1944, because of obvious, inconsistent differences in the choice of procedures for the treatment of pulmonary tuberculosis in the states of Michigan, Wisconsin and Minnesota, delegates from representative institutions in these states were assembled to discuss these differences. Similar meetings have been held each year since 1944. There is now agreement on many things which, in the earlier years of the conferences, formed the basis for heated discussions. Sufficient differences still exist at a state level to warrant the continuation of these conferences each year.

In speaking of the changing trends in tuberculosis therapy during the past ten years, this presentation will refer primarily to experiences in Wisconsin, but the same trends are also quite apparent in the neighboring states of Michigan and Minnesota.

A logical way to present the present therapeutic program is to compare some of the procedures used in 1940 with those used in 1949. The statistics presented are from Muirdale Sanatorium, a county sanatorium with a capacity of 500 beds in 1940 and 600 beds in 1949.

Data for 1940

In 1940 pneumothorax was recommended for 162 patients but could not be induced in 63 because of pleural symphysis. One patient died from an air embolus during the attempted induction. In 30 of the 162 patients pneumothorax was continued for less than six months; in the remaining 69 patients it was continued for six months or more; 39 of these had unilateral pneumothorax and 30 had bilateral pneumothorax (making a total of 99 pneumothoraces continued for six months or more).

In this latter group, the thoracentesis of 19 pleural cavities was required one or more times for relatively clear fluid; in 11 others (11 per cent) repeated thoracenteses were required for removal of thick pus.

Intrapleural pneumolyses, in one or more stages, were performed in 44 instances.

Sixty-nine patients receiving pneumothorax out of a total of 500 in a sanatorium does not appear to be an excessive percentage even by the present standards for some parts of the country. However, when the results of pneumothorax in these 69 patients were analyzed, they were found to be poor. Eighteen (26 per cent) of the patients are known to be dead; 15 (22 per cent) required subsequent surgical collapse therapy procedures after abandonment of pneumothorax. The best results were in 30 patients who were discharged with ambulatory pneumothorax. However, seven of these 30 subsequently were readmitted to the sanatorium because of reactivation of the disease. Follow-up study on the remaining 23 patients (33 per cent) was not carried out, but it is not probable that the disease remained inactive in all of them. Even if it were assumed that all 23 were well and working today, the percentage of good results for the series would still be discouraging. And it is well to point out that the patients who had subsequent surgical collapse procedures wasted considerably more than six months in the sanatorium receiving ineffective pneumothorax prior to the surgical treatment.

In 1940, thoracoplasty was done on only 17 patients.

Data for 1949

During the year 1949, pneumothorax was recommended for 17 patients and was induced in all cases. The pneumothorax has been continued in only two cases; in the others it was abandoned within less than a month of induction because of limiting adhesions. Thoracentesis was not required for any of the 17 patients. Five patients had exploratory thoracoscopy, and one of the two patients in whom pneumothorax was continued had intrapleural pneumonolysis—a procedure which is falling into disuse in Wisconsin and environs.

During 1949, first stage thoracoplasty was done in 58 cases. In only two of the 58 cases had pneumothorax been attempted before thoracoplasty. In other words, in 56 of the 58 cases the operation was so-called primary thoracoplasty.

TREND IN NEIGHBORING STATES

The same trend away from pneumothorax has taken place in the neighboring states of Michigan and Minnesota, although at a slightly slower rate

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TABLE 1.—*Therapy Comparison*
(Three selected sanatoria from each state)

	1943	1944	1945	1946	1947	1948
Minnesota:						
Pneumo	26.8%	24.0%	23.0%	17.2%	12.5%	8.6%
Phrenic	3.2	6.7	10.9	9.7	5.1	4.6
Thoraco	15.8	16.6	25.4	24.5	11.9	23.5
Resection	.22	.116	.71	.113	.56	.96
Wisconsin:						
Pneumo	24.6	14.9	13.5	14.2	17.6	4.5
Phrenic	10.2	13.2	14.6	17.6	13.0	12.1
Thoraco	13.4	12.0	8.8	9.4	9.5	13.1
Resection	0.0	.12	.14	.28	1.58	1.85
Michigan:						
Pneumo	25.9	15.9	16.6	16.9	13.6	11.9
Phrenic	64.5	42.1	45.2	35.0	34.2	35.5
Thoraco	11.1	8.9	17.6	12.2	19.2	18.3
Resection	.15	.31	0.0	.65	2.18	9.01

(see Table 1). The figures in Table 1 were collected from representative institutions in each state and were presented at the last tri-state therapy conference. They are based on the average sanatorium census for each year. Interesting differences in the relative usage of other kinds of therapy are also apparent. Although the staffs of the Michigan sanatoria have lost some of their enthusiasm for phrenic paralysis, they are still using the procedure more than physicians in the other two states ever did. If figures for 1949 were included, the pneumothorax percentages would be even lower. For instance, a recent report from Glen Lake Sanatorium, near Minneapolis, which has a capacity of nearly 600 beds, indicates that pneumothorax was induced and continued in only 17 patients in 1949. This is approximately 3 per cent of the average number of patients.

To emphasize again the wide differences in the choice of therapy for pulmonary tuberculosis which exist between different parts of the country, at a tuberculosis therapy conference last fall in Texas at which delegates from Texas met with delegates from two neighboring states, a physician representing one of the sanatoria in the deep South explained that the indication for pneumothorax in that sanatorium was the presence of tubercle bacilli in the sputum; and at the last meeting of the Mississippi Valley Trudeau Society, a physician from Illinois presented a paper on pneumothorax, concluding that 25 per cent of all patients in a sanatorium should be suitable candidates for the procedure.

Some of the county sanatoria in Wisconsin with a capacity of 70 to 80 beds have no patients at all receiving pneumothorax; others have only two or three.

The trend away from the radical use of pneumothorax that has taken place in Wisconsin and neighboring states reflects a conviction that the morbidity, mortality and reactivation rates in patients given pneumothorax were excessive. At Muirdale it is the belief that primary thoracoplasty, when feasible, is a far safer and more satisfactory type of collapse therapy.

A review of 254 consecutive thoracoplastic operations done in the period 1938-1947 was completed recently. Although in a high percentage of cases the operation was done as a last resort on patients who were poor risks, 193 patients (76 per cent) had negative cultures of pulmonary secretions following the procedure. There were four deaths (1.5 per cent) within three months of operation. Only five of the patients who were originally discharged from the sanatorium with the disease inactive have had subsequent reactivation. This is in sharp contrast with the high rate of reactivation in patients who received pneumothorax.

Data on the various types of pulmonary tuberculosis for which thoracoplasty was done, together with the results of conversion of pulmonary secretions in each group, will be found in Table 2. Most of the patients in the last group listed in the table, those with "destroyed lungs," appeared to be beyond help at the time of operation.

During 1948 and 1949 thoracoplasty was done in almost twice as many cases as in any two years previous. The use of streptomycin accounted for part of this increase although the continued trend away from pneumothorax undoubtedly was equally responsible.

TABLE 2.—*Conversion of Pulmonary Secretions After Thoracoplasty According to Type of Disease*

Type of Disease	Patients	Patients Converted
Fibrocaseous	137	104 (76%)
Fibroid	27	23 (85%)
Caseocavernous	15	11 (73%)
Tension cavity	45	34 (75%)
Destroyed lung	23	15 (65%)

The indications for pneumothorax in use at present at Muirdale are: (1) Minimal lesions with positive secretions not responding to phrenic paralysis and/or bed rest; (2) moderately advanced mixed lesions in patients below age of 21 not responding to phrenic paralysis and/or bed rest; (3) occasionally, far advanced bilateral lesions not responding to bed rest as last resort measure; (4) thoracoplasty contraindicated because of other disease.

It is felt that a stubborn minimal lesion which does not respond to bed rest and/or phrenic paralysis is the best indication for pneumothorax. For patients below the age of 21, particularly girls, thoracoplasty is used with reluctance because of the increased tendency to scoliosis in this age group. If intrapleural pneumothorax cannot be used, extrapleural pneumothorax or another extrapleural procedure sometimes is carried out. Results in patients with advanced bilateral lesions are rarely satisfactory, and the procedure is seldom done on this indication.

Contraindications to pneumothorax are: (1) Predominantly exudative disease; (2) predominantly

fibrotic disease and known old disease; (3) tension cavities; (4) peripheral cavities; (5) lower lobe disease; (6) tuberculous tracheobronchitis with or without atelectasis. In the author's experience, most of the worst results of pneumothorax have been in patients with acute disease. Not only are the therapeutic results unsatisfactory in this group but the incidence of pleural complications is high. In reviewing cases in which thoracoplasty was done, the author was amazed to find how good the results were in the patients with so-called tension cavities. For lower lobe disease, preference is given to phrenic paralysis, with or without pneumoperitoneum, followed by resection if necessary.

The program of early management of patients given pneumothorax is just as important in avoiding complications as is the selection of patients for the procedure. The guides in this respect are:

1. No patient given pneumothorax without preliminary period of at least two months' bed rest.

2. Cases classified at time of recommendation as "exploratory," "elective" or "imperative."

3. Cases reviewed by staff seven to ten days after induction with films taken on inspiration and expiration, and in those with indivisible adhesions not suitable for pneumonolysis pneumothorax is abandoned immediately.

4. Intrapleural pneumonolysis performed within three weeks of induction when necessary. In cases with indivisible adhesions pneumothorax is abandoned immediately.

5. Streptomycin given during induction period if any exudative component present.

6. Pneumothorax abandoned promptly if more than usual amount of fluid accumulates or if cavity enlarges.

The classification listed as item 2 in the list was adopted primarily to guide the surgeon in case the patient requires pneumonolysis. The decision as to whether to divide certain adhesions often depends on how badly the patient needs the pneumothorax. Such a classification makes it unnecessary for the surgeon to attempt to evaluate the need for pneumothorax in the operating room, a task which is not only time-consuming but also not always entirely accurate. When pneumonolysis is necessary, it is done early; and when adhesions cannot be divided, pneumothorax is discontinued.

About the time a clear set of principles with respect to pneumothorax therapy had been adopted, there was an influx of patients with pneumothorax, discharged from service institutions to the two Veterans Administration hospitals in Wisconsin. Observation of these patients confirmed previously formed convictions in regard to the contraindications for pneumothorax. In most cases salvaging the patients has been a difficult task.

The author has positive, although possibly provincial, views on the treatment of pulmonary tuberculosis with measures other than pneumothorax. Bed rest, particularly in the early stages of pulmonary tuberculosis, is of great value. Operations, with the exception of temporary phrenic paralysis, should be withheld until there has been opportunity to evaluate a patient and to obtain some idea of the degree of his resistance to the disease. On the other hand, care must be taken not to waste a patient's time unnecessarily, particularly if he has extensive, predominantly unilateral disease with cavitation. Although such disease can become arrested with prolonged bed rest with or without the help of phrenic paralysis and/or pneumoperitoneum, in such cases preference is given to thoracoplasty as soon as feasible. It is felt that this not only saves the patient considerable time, but also that the risk of subsequent reactivation of the disease is much less than if it had apparently been arrested with other measures. The accusation has been made that in some cases thoracoplasty was done prophylactically. That is true, and the author is well satisfied with the results in such cases.

It is believed that the best candidates for streptomycin therapy are also candidates for thoracoplasty. For such patients, thoracoplasty is started six weeks to two months after the streptomycin is started, and the drug is continued until two weeks after the last stage of thoracoplasty. This regimen may or may not be logical, but extremely satisfactory results have been obtained with it.

Temporary phrenic paralysis may be used early with the idea of enhancing the results of bed rest and shortening the patient's stay in the sanatorium. At Muirdale it is used for relatively recent and not too extensive disease. It is not expected to perform the miracles which some Michigan colleagues claim for it. The author is inclined to add pneumoperitoneum to phrenic paralysis where maximum elevation of the hemidiaphragm is imperative. If injection of air is to be done in exudative disease, the combination of phrenic paralysis and pneumoperitoneum is preferred to pneumothorax.

In regard to the use of pneumoperitoneum in general, it is felt that it is being used far too much throughout the country, although it is agreed that there are a few indications for it, particularly in lower lobe disease. Review of cases treated in various parts of the country has led to the conclusion that pneumoperitoneum is being used too much in two groups of patients. In the first group, the procedure probably does no good and any incidental improvement can be attributed to other factors; in the second group, pneumoperitoneum is being used when some much more definitive form of treatment, such as thoracoplasty, is actually indicated.

Finally, it is felt that there are few instances in which primary pulmonary resection is indicated rather than primary thoracoplasty. One reason for reviewing thoracoplasty results recently was to find out, if possible, whether the results associated with any particular type of disease were poor enough to warrant the use of primary resection in preference

to thoracoplasty. The result was satisfaction with thoracoplasty in the groups for which it had been used.

One by-product of this thoracoplasty study was observance of the high rate of conversion of pulmonary secretions following thoracoplasty. This is of importance particularly when trying to decide when certain thoracoplasties must be regarded as failures. Of 187 patients whose pulmonary secretions converted from positive to negative on culture following thoracoplasty, the time of conversion was as follows: By the end of six months, 89 (47.5 per cent); between six months and one year, 30 (16 per cent); between one year and two years, 33 (17.7 per cent); between two years and three years, 20 (10.7 per cent); over three years, 15 (8.1 per cent). These figures would seem to justify a conservative attitude in regard to pulmonary resection following thoracoplasty unless, of course, there is obvious cavitation or bronchial disease present.

Open Pneumonolysis in the Treatment of Tuberculosis

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OPEN pneumonolysis is the severance of adhesions through incision and exposure of the pleura in the course of artificial pneumothorax. It is used in cases in which the severance cannot be accomplished by closed pneumonolysis.

This surgical procedure is rarely indicated since, if the adhesions are too extensive, or the space too small for the successful manipulation of instruments in closed lysis, it is usually better to expand the lung and carry out thoracoplasty or some other surgical procedure.

However, there are individual cases in which open lysis may be a life-saving measure. This is particularly true in cases in which massive hemorrhage occurs during intrapleural pneumonolysis.

At Olive View Sanatorium, open pneumonolysis was first done in 1937. The last such operation was carried out in 1947. There was a span of years in which the operation was not used. At first the operation was employed in cases of bilateral disease in an attempt to get the disease in one lung under control before the other was collapsed. Now the operation is considered indicated only in the event of hemorrhage during intrapleural lysis — an infrequent occurrence.

CASE REPORTS

CASE 1: A 24-year-old male had pneumothorax on the right with adhesions, and there was a small cavity in the left apex. Pneumonolysis was tried and failed, so open lysis was done and all adhesions cut. Complete collapse followed, but gradually enough expansion developed so that contralateral pneumothorax was given and the patient was discharged a year later with pneumothorax on both sides. He is still living and well.

CASE 2: A 39-year-old diabetic patient, admitted January 22, 1945, had closed lysis on June 10, 1945, and open lysis July 30, 1945.

This patient had a mid-lung cavity. Pneumothorax was tried. The cavity closed a little, but fluid accumulated.

Closed pneumonolysis was not successful, so open lysis was done and the patient went home with the cavity closed. However, an x-ray film of April 23, 1946, indicated that pneumothorax might have to be discontinued.

CASE 3: A 30-year-old male was admitted with bilateral disease in September 1945. Right artificial pneumothorax was started on July 3, 1946. Closed intrapleural pneumonolysis, attempted in December 1946, was not feasible, so open lysis was done in January 1947. This was followed by repeated aspirations of bloody fluid until none was obtainable.

A left pneumothorax was started six months later, and the patient left the sanitarium in 1949 with the disease quiescent and sputum negative for tubercle bacilli. One hour of exercise daily was permitted before discharge, but exertion caused dyspnea. Decortication probably should have been done.

CASE 4: A 40-year-old female was admitted in 1941 and discharged in 1946. The patient had ulcerative tuberculous tracheobronchitis. Bronchoscopy was done repeatedly. The condition cleared in 1945 and right pneumothorax was started. Eight months later, closed intrapleural pneumonolysis was done. Two months later in another attempt at lysis, arterial bleeding which could not be controlled developed. The chest then was opened, the bleeding vessel was tied, and adhesions were severed. A little fluid accumulated, then cleared. At the time of discharge, the sputum had been negative for tubercle bacilli for over a year; pneumothorax was still in effect.

If cutting an adhesion is not feasible on thoracoscopy, then it is wise, if possible to expand the lung and try some other form of collapse.

Olive View Sanatorium.

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Practical Methods of Determining Pulmonary Function

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A REVIEW of the literature on the evaluation of respiratory function in an attempt to find something practical and understandable is a discouraging task. A few, but very few, papers have appeared which are comprehensible to physicians who are not primarily research physiologists.

For a number of years the author has been interested in the practical application of such tests, particularly as they apply to the evaluation of patients with pulmonary tuberculosis who are candidates for major, irreversible collapse therapy procedures. He has attempted to find and evaluate such tests as can be done with relatively simple, inexpensive equipment, and which can be carried out without the aid of a fully equipped department of research physiology.

Having used bronchospirometry in selected cases for the past nine years, the author is convinced that this is a useful, practical procedure and gives information in certain cases in regard to the comparative function of each lung which cannot be obtained in another way. Patients who otherwise would have been refused surgical treatment have been accepted for operation on the basis of bronchospirometric findings; others have been turned down, and in still another group there have been warnings to proceed cautiously.[2]

Bronchospirometry is not without sources of error and not all determinations run off smoothly, but the majority of them do.

The equipment required for bronchospirometry consists of a double-channel catheter and two basal metabolism machines. The tip of the catheter is passed into the left bronchus under fluoroscopic guidance and the balloons on the catheter inflated in the left bronchus and the trachea. The basal metabolism machines are connected to each side of the catheter and the oxygen consumption and ventilation of each lung determined separately and simultaneously. The average determination runs for about five minutes.

While bronchospirometry is extremely valuable and gives an estimation of the function of each lung separately, the procedure is not performed under basal conditions and gives no estimate of total pulmonary function or of respiratory reserve.

Probably the simplest, most practical method for obtaining an estimate of total ventilatory function and thus, in most cases, of respiratory reserve is that proposed by Warring,[3, 4] who first determines the maximum breathing capacity. This is done by measuring the quantity of air a patient breathes into a Douglas bag with maximum respiratory effort for one half minute, the result then being multiplied by two. Normal values range from 100 to 150 liters.

Maximum breathing capacity is a far better basis for accurate estimate of a patient's ability to ventilate than is the vital capacity. In a patient with considerable emphysema, the inspiratory effort may be normal but expiration considerably prolonged. Such a patient, even with dyspnea, may have a "good" vital capacity. When maximum breathing capacity is determined, the sum of a series of respiratory efforts is determined and a much more accurate estimate of ability to ventilate is obtained.

After obtaining the maximum breathing capacity, Warring has the patient walk for a distance of 180 feet in one minute while exhaling into a Douglas bag. Thus the amount of ventilation required for a measured amount of exercise is obtained. This amount will usually range from 8 to 30 liters per minute.

The ratio of walking ventilation to maximum breathing capacity gives an estimation of ventilatory reserve. This is obtained arbitrarily by dividing the walking ventilation by the maximum breathing capacity. The result is a perfectly simple ratio and not nearly as mysterious as those usually found in reports on the evaluation of pulmonary function. A ratio of 0.35:1 is borderline and any figure higher than this usually indicates a poor respiratory reserve.

The author has been obtaining the ratio between walking ventilation and maximum breathing capacity for the past three years on most patients prior to thoracoplasty or resection for tuberculosis. In that time 128 patients have been evaluated. Sixteen of these were rejected for operation because of high ratios. Of eight patients who were operated upon in spite of borderline ratios, three did not do well and one of the three died soon after completion of thoracoplasty. Often poor ventilatory function can be predicted on the basis of the extent and character of previous pulmonary involvement. On the other hand, some patients who would be expected to have high ratios because of extensive disease and pleural reactions have actually had low ratios and have been accepted for the operation which otherwise might have been withheld.

The author is not prepared as yet to say that the determination of the ratio between walking ventilation and maximum breathing capacity is an indispensable procedure and that it is more accurate than an accurate clinical evaluation of a patient whose clinical course is well known to the examining physician. However, Warring's method is being

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relied upon more and more, particularly to confirm clinical impressions. In the case of a patient who is refused operation because of a low respiratory reserve, it is reassuring to all concerned to have clinical impressions backed by actual figures.

When a surgeon is observing a large number of patients in consultation, it is practically impossible for him to evaluate all the marginal risk patients personally. His decisions are likely to be more accurate if figures on pulmonary function are available.

If the author were limited to only one test in the evaluation of ventilatory function, he would choose maximum breathing capacity. The equipment required for this test is relatively inexpensive and simple.

Often valuable information in regard to pulmonary ventilation can be obtained by fluoroscopy. Every patient being evaluated should be fluoroscoped.

It is not meant to imply that other tests, such as determination of blood oxygen saturation before and after exercise and the determination of residual air, are not valuable. In fact these tests occasionally may indicate poor function when ventilation has been found to be normal. This is true in cases in which there is interference with oxygen absorption. However, the equipment and staff required for determination of blood oxygen and residual air places these tests out of reach of a majority of institutions. Warring's method can be used in any institution and bronchospirometry can be performed in most. While Warring's method actually measures only ventilatory function, when ventilatory function is poor, all aspects of pulmonary function are poor.

A recording spirometer is available for determining maximum breathing capacity.[1] This spirometer has the advantage over a Douglas bag in that a graphic tracing is obtained as a record and the prolonged expiratory efforts of emphysematous patients can be seen graphically. This spirometer is by no means essential and its greatest drawback is that it is quite expensive when compared with the cost of the equipment required when the Douglas bag is used.

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The Use of Extrapleural Pneumonolysis Followed by Paraffin or Lucite Filling

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THE use of extrapleural paraffin filling in the treatment of pulmonary tuberculosis has not gained wide acceptance because this operation has a rather unsavory reputation for being accompanied by such unpleasant complications as expectoration of paraffin, extrusion of the paraffin from the wound, the development of empyema in the extrapleural space and so forth.

In the past 12 years the author has used paraffin 67 times in 60 patients rather successfully without encountering any of the complications mentioned except for the expectoration of paraffin in three cases. From 1938 to 1944 extrapleural pneumonolysis with paraffin was carried out on 45 patients. Five of these patients had bilateral operations, making a total of 50 operations on 45 patients who have been followed for five years or more. During the past five years 15 patients had paraffin fillings; two of these had bilateral operations. A detailed report of the first 39 patients has been made previously.[3]

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The author limits the use of paraffin to patients having relatively small apical lesions, the entire extent of which is not over 5 cm. in diameter with cavities no larger than 1.5 cm. in diameter. The amount of paraffin used in any one filling is limited to 200 gm. and it is preferred to keep the amount closer to 100 gm. No attempt is made to free a parietal pleura which is densely adherent to the chest wall. It is believed that these limitations account for the relatively small number of complications in this series.

The paraffin used has a melting point of 52° C., and the technique of preparation followed is that described by Alexander.[1]

In general the author prefers thoracoplasty to extrapleural pneumonolysis followed by paraffin filling, and paraffin is used only in those cases in which thoracoplasty is considered to be contraindicated. However, the use of paraffin is given preference over a three- or four-rib thoracoplasty because it is believed that the relaxation of the lung effected by the pneumonolysis and maintained by the paraffin is more easily controlled and is more permanent than that brought about by thoracoplasty of that extent.

The results of small paraffin fillings (100 to 125 gm.) for small apical lesions remaining in the contralateral lung after thoracoplasty have been particularly gratifying. This type of lesion was the indication for five of 15 paraffin fillings carried out during the past five years. During the same five years a total of 206 patients in the same institution had thoracoplasty. Hence it is apparent that there has been no undue enthusiasm for paraffin filling. On the other hand, enthusiasm for the procedure is not waning, since seven of the 15 patients thus treated during the last five years were operated upon in the year 1949.

The operations upon two of the three patients who expectorated paraffin were done very early in the series for lesions which now would be considered indication for thoracoplasty. One of these patients died. The other expectorated a small amount of paraffin on one occasion several years ago but has not expectorated any more and has been entirely asymptomatic. The third patient had an excessively large paraffin filling in 1942 for a relatively small apical lesion. He moved to California where lobectomy was performed and the paraffin removed. The present condition of the patient is reported to be good.

Use of extrapleural pneumonolysis followed by filling with lucite balls has been limited at Muirdale Sanatorium because of Trent's[4] report of the dire complications in the early cases at Duke University. The operation has not been recommended primarily in any case in which thoracoplasty appeared to be indicated. With the exception of two patients, all patients on whom this operation was done had had thoracoplasty recommended but had refused. In those cases the lesions were in general diffuse but not dense, and there were no large cavities. In order to investigate the limitations and possible advantages of the lucite balls procedure, the operation was offered to patients, who were told the possible disadvantages and informed that thoracoplasty probably would be necessary if complications occurred.

On the whole, results have been fairly satisfactory, although in two cases there was progression of the disease below the area of pneumonolysis. Seven patients were operated upon at Muirdale Sanatorium and four at the Veterans Administration Hospital at Wood, Wisconsin, from 1946 to 1949. So far there have been no complications which could be attributed to the presence of the balls as foreign bodies. It is suspected that the patients given this treatment had considerably less extensive lesions than the patients reported upon by Trent.

It is probable that the patient reported upon by Geever and Stone,[2] who was asphyxiated by a lucite ball, actually should have had thoracoplasty rather than an extrapleural pneumonolysis because of the character and extent of the lesion.

In the belief that paraffin is a relatively safe foreign body, the author has not felt justified in using lucite balls in any case in which the lesion appeared suitable for paraffin filling.

Because lucite balls are considerably lighter than paraffin, they can be used for lesions requiring a more extensive extrapleural dissection than would be dared for paraffin fillings.

CONCLUSIONS

Extrapleural pneumonolysis followed by paraffin filling is a safe, useful operation in carefully selected cases.

As to filling with lucite balls, it is felt that there should be a longer period of observation of patients who have had that treatment before consideration is given to broadening the present limited indications for the operation.

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The Basic Principles of Collapse Therapy

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SUMMARY

Collapse therapy has a definite objective of resting and healing tuberculous lesions. It should be used, not so much as an independent means, but as a supplement to other established practices in the treatment of tuberculosis.

The indications for each measure have changed over the years and are still changing, so that proper treatment can be given only by those having a knowledge of the changing trends, as well as of the disease and principles of treatment. Each case should be handled on its merits and the choice of procedure should depend generally upon the circumstances, such as the skill of the physician carrying it out, the facilities for the care of the patient, and the equipment for working. Above all, it should be recognized that knowledge, experience, and especially wisdom will go far towards achieving good results.

THE sole aim of collapse therapy is to heal tuberculous lesions by rest. This trite pronouncement may seem overly simple, yet in the past, and even at present, neglect of the important principles and precautions has brought much discredit on some forms of collapse therapy in the treatment of tuberculosis. The purpose of mentioning these facts is first of all to prevent beginners from falling into error; to improve results by a better selection of cases; and to rescue certain methods from possible disrepute.

During the last few decades many new procedures have been introduced, yet there is not one of the old established methods that can be neglected. Rest of an active disease process—the first principle of medicine — was first applied in tuberculosis by Bremher, Detweiller, Trudeau and others. Bodily rest was first applied and later other accessory forms of rest, such as collapse therapy, were added. All are agreed that collapse therapy must be applied; the chief differences of opinion concern the emphasis to be placed on different methods. Each has had its enthusiastic advocates who have been prone to show their particular procedure to advantage, especially during the first stages of experimentation. However, we should not be too hasty in condemnation of anybody, because when an experimenter works for a long time on a particular method, he becomes more proficient in its techniques than those who use it rarely. If we follow the old Indian proverb, we will hesitate to judge any man until we have walked for two moons in his moccasins. Final results form the ultimate criteria for judgment.

Before considering specific methods, it may be well to mention the basic prerequisites to any successful treatment: Total rest, proper diet, warmth, proper "environment" (in the meaning of the word as originally expressed by Krause[2] in his admirable booklet), and finally, the psychological "conditioning" of the patient.

Neglect of the principle of total rest (during the early course of the treatment) is the main reason for so many failures in collapse therapy.

Perhaps the first task to be accomplished after a diagnosis has been made is the psychological indoctrination of the patient. His mind must be brought under control and put in tune with what is to follow. Without such precautions, the work of many months may come to naught.

Patients must be persuaded to give up all their ambitions and plans and do precisely what they are told. The business must be taken over by someone else; the family must be managed by another; there must be no worries over the stock market, cattle on the range, girl or boy friends or any of the other factors of daily life that may increase the pulse or raise the blood pressure. It is not always necessary to talk tough—quite the contrary. The physician must gain the confidence of the patient by taking plenty of time to explain and to school him in what must be done.

The second requisite is to keep the patient's cooperation at the maximum. Every patient will have upsets and discouragements, especially early in treatment. These episodes must be met with patience and wisdom. Many times failure of treatment is due not so much to the "problem" patient as to the lack of preparation and lack of patience or understanding on the part of the physician.

As the next step, the whole physical make-up of the patient must be surveyed; complications must be sought out and treated. Proper diet and medication must be prescribed. Social tangles must be unsnarled. An intelligent social service can help in this work. A properly trained nurse must begin her duties of "taking over" the patient and explaining the role of the nurse in her relationship to him, as well as helping to orient him in the new life. After these many preliminaries are finished and the patient studied for a period ranging from 30 to 90 days, collapse therapy and other methods may be considered and applied as required.

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Collapse therapy is of two radically different types, the temporary and the permanent; and each has its particular advantages and drawbacks. The types of temporary collapse—phrenic nerve crushing, extrapleural and intrapleural collapse with air, oil, or other medium—have the advantage of reversibility. Permanent collapse — thoracoplasty, complete extraction of the phrenic nerve, etc.—usually involves a tendency toward total healing with permanent loss of function of the collapsed part of the organ. The stages of healing are, in most permanent operations, more certain and rapid than those described for the temporarily collapsed lung.

In order to clarify indications, it is well to review the basic principles involved, more especially with regard to temporary collapse.

The first result of lung collapse is immobilization of the organ and its contents. The tuberculous lesions are made more compact, the cellular barrier becomes more impermeable, and both bacillary and toxic elements are better confined.

The great unknown in tuberculosis is the interplay of dosage and virulence of the particular strain of bacilli with a number of variable factors such as age, sex, race and that thing sometimes called resistance. A proper combination of favorable factors in the patient may lead to rapid cure; with unfavorable factors uppermost the outcome may be fatal.

In the disease process the spread and increase in numbers of bacilli are counteracted by infiltration and phagocytic action of outside cellular elements and by action of cells and tissues *in situ*. When the increase of bacilli is more rapid than the destruction of them by phagocytes, or when the cellular barrier does not stop the spread of the bacilli, the disease continues to be progressive. The progress around the margins of the lesions is of greatest significance. The center of the tubercle may be a miniature caldron of toxic material, but unless an opening is made in the margin, or into one of the vascular or bronchial canal systems, no extension of the disease can occur. The margin, therefore, is the battle line where the principal ebb-and-flow of the disease takes place. If the spread is not overwhelming, a capsule soon begins to form, resorption of perifocal exudate takes place and healing gets under way.

Collapse therapy facilitates this healing process; in complete collapse there is absolute cessation of tissue mobility and effective containment of bacilli and their toxins. Complete collapse in pneumothorax, however, is fraught with many dangers, particularly effusion, infection and empyema. The Ascoli method of "hypotensive" or selective collapse is usually practiced. With this method there is only a partial collapse of the lung, but the diseased area contracts more in proportion than the surrounding normal lung. Local atelectasis develops which, with skill, may be controlled until good healing occurs. Great skill is required in the timing of instillations and in controlling the degree of collapse.

Along with the contraction of tubercles and infiltrates is the greatest of all effects produced by collapse therapy—a compression of cavities. Sometimes it requires weeks for a cavity to close, even with collapse therapy, although there is always a relative decrease in the amounts of sputum and bacilli eliminated. If closure is not effected after a reasonable trial, or after adhesions have been cut, the temporary collapse therapy should be abandoned and permanent collapse resorted to.

Collapse does another thing almost as important as those just mentioned: It slows both blood and lymph circulation. Carvalho,[1] Steinberg[3] and others have shown by angiopneumography that the blood circulation is cut down in proportion with the degree of collapse of the lung. This change in circulation, first, reduces absorption of toxins into the system and, second, cuts down on nourishment to the bacilli. Since tubercle bacilli may survive for long periods in immobilized tissue, the immediate effect is to reduce absorption of toxic elements, including tuberculin, which is reflected in a proportional reduction of constitutional symptoms.

Perhaps another factor which arises in this alteration of the physiologic state should be mentioned—the reduction in tissue metabolism which would reduce the catabolites and thus remove some drawbacks to healing.

After the acute phase of collapse has been stabilized, the second phase begins—the process of encapsulation of lesions and resorption of certain elements within the tubercle. In reality this is a continuous process, for encapsulation begins very early and, as the spread of the disease is controlled, more and more fibers form in the outer wall of the lesion until a true capsule results. Only occasionally does spread occur once this stage is reached. In the majority of cases, completion of the healing process ensues—destruction of the bacilli and resorption of the residual toxins, of removable caseous material and even of calcareous material. During this period the properly closed cavity will fill in with fibroblasts and capillaries, leaving behind a relatively small stellate scar at the site of the cavity.

The final process is reexpansion with the restoration and restitution of tissue. The ultimate restoration of function depends upon the extent of direct destruction of tissue by ulceration, the amount of caseous material that becomes encapsulated, the injury to cells by toxins, and the distortion of tissues by fibrous contraction. Most of these effects are self-evident. The toxic effect on cells, however, has far more significance than is ordinarily appreciated. Any tuberculous process, no matter how mild, leaves a blighting effect on all the cells in the vicinity. This is a fundamental difference between tuberculosis and most other lung diseases. Even a mild gelatinous exudate with greatly diluted toxins will singe the cells, weaken the elastic tissue and result in varying degrees of emphysema. This may be called the "emphysema of healing," because it is always present in a healed tuberculous process. The extent of emphysema may be of any degree from zero to a total loss of function.

The final changes involve the slow resorption of caseation, calcification and even of fibroid tissue. In this process of fibrosis and resorption, the contraction of fibrous tissue results in many distortions which may interfere with function. Noteworthy in this respect is the constriction of bronchi leading to obstruction or partial obstruction, obliterative pleuritis, a buckling of bronchi, deviation of trachea, and sometimes a constriction of the great vessels, especially the vena cava and pulmonary arteries and veins.

There are almost as many physiologic as anatomic changes. Besides the slowing of circulation already mentioned, there is a reduction of toxins which reduces the objective clinical symptoms; an increase in collapse which reduces the vital capacity, minute volume, ventilatory capacity and all vital pulmonary functions. The distortion of bronchi and vessels, and especially the emphysema lead to a reduction of pulmonary function which sometimes is manifested by permanent dyspnea. As recovery approaches, most patients regain enough function to carry on in a new vocation properly selected in an intelligent rehabilitation program.

As to permanent collapse, the process is sudden and total. The lung should be completely compressed. The bacilli are entrapped and suddenly smothered. Healing proceeds more swiftly and is more certain. Occasionally a thick-walled cavity is not closed, and in that event revised collapse procedure or resection is carried out.

A word of caution at this point: It should be remembered that many tuberculous processes extend to the lymph nodes beyond the lungs and to other organs, so that often extrapulmonary disease must be dealt with concurrently. In these circumstances only rest and lung therapy offer any hope.

After this survey of principles, it becomes a problem to decide upon the most desirable method of treatment. The choice depends upon two main factors: The nature of the case in question, and the particular experience of the physician who is to carry out the treatment. The choice should be governed by the maximum results possible in the shortest time and with the least inconvenience to the patient. Factors that must be considered are the character, extent and location of the lesion, duration of the process, size and position of cavities, if any, and the presence of associated lesions, especially enteritis, pleuritis, laryngitis, bronchitis and, particularly, bronchial obstruction.

As to choice on the basis of the particular experience of the physician conducting therapy, it must be recognized that whereas the majority of cases fall automatically into certain categories, there are perhaps 30 per cent in which no hard and fast rules may be applied. In such cases a justifiable difference of opinion may exist, and the method of collapse used may depend largely on the background and training of the therapist.

Furthermore, new phases of treatment have appeared, viz: Chemotherapy and excisional operation. In many cases simple drug therapy, or excision, or both, may be more suitable than collapse therapy. In other cases these methods of treatment may be advantageously combined with collapse, and in such cases the collapse measures are applied as they have always been. These important additions to the magazine of therapy have of course greatly altered the indications for collapse therapy.

Since different methods may arrive at the same result, it may help to illustrate the process of choice with example. Take, for example, decision between pneumothorax and upper stage thoracoplasty. Assuming that the indications are ideal for pneumothorax (small cavity, deep in the upper lobe, no complications, etc.) probably the majority of therapists would employ that method of treatment and risk the later hazards of fluid accumulation, empyema, adhesions, etc., to carry it out over a three to five year period. Of all possible operative procedures, it should be considered first. It has been used with success in thousands of cases. Most of the bad results have not been the fault of the method, but of the way it was carried out.

If pneumothorax is decided upon, the patient must be told that hospitalization and complete rest are necessary during the early stages of treatment. Even later, dissipation of any sort, including smoking and excessive drinking, is tabu. The patient must keep free from worry and must eat well. He must always keep warm and avoid chilling. If he contracts an infection, he must go to bed and call the physician. The physician must follow the patient closely so that no complications are permitted to develop.

The dangers inherent in the procedure should not be underestimated. With sound training, however, the hazards of well carried out pneumothorax should be slight.

On the other hand, upper stage thoracoplasty will often do just as much and do it in a shorter time. After a few months, the patient is permanently cured. Refills are not necessary, there is no danger of accumulation of fluid, and disciplinary problems are fewer, although bed rest must be continued until all constitutional symptoms are gone. A disadvantage of the operation is the scar, which to some patients is objectionable. Another important drawback is that the method requires more equipment, special skill and better facilities. Perhaps the greatest objection to the operation is that there is always much good lung tissue permanently sacrificed. Later in life this small segment of lung may be the difference between survival and progressive cor pulmonale.

In choosing the method of treatment it may also be necessary to consider phrenic nerve crush with or without pneumoperitoneum. There is little doubt that the first wave of phrenic operation stirred unjustifiable enthusiasm for its use—so much so that one great surgeon questioned whether it might not be "a crime wave."

The phrenic operation, however, is used in many clinics with tremendous success. There is no doubt

that it does much more than relax the diaphragm and the lower lobe. It relaxes the whole lung, all the way to the apex. The result is almost the same as that of hypotensive pneumothorax, except that the lung is relaxed vertically more than horizontally. Furthermore, the effect lasts from three to six months and there is no danger of accumulation of fluids.

When phrenic crushing is used with pneumoperitoneum and drug therapy, the result is in some cases better than that obtained with pneumothorax. Perhaps one of the most significant changes over the last five years has been the increase in the use of pneumoperitoneum (with or without phrenic crushing and drugs) and a corresponding decrease in the use of pneumothorax. Pneumoperitoneum has not yet become universally appreciated, but the use of pneumothorax has decreased. A decade ago it was used in 30 to 40 per cent of cases in many hospitals; now in about 20 per cent of all cases.

Although the whole basis of treatment is changing rapidly, methods and factors in therapy that are known to be sound should not be lost to view. The principle of rest still is applicable wherever and whenever it is indicated. It should be applied to the maximum where the indications are sharp, and supported to the limit with every means available.

There are certain abuses that cannot be condoned. Perhaps the most common in the past has been neglect of proper indoctrination of the patient as to the disease and the need for rest. This has been due to several things. All too many physicians have lost sight of the need for the application of rest, *in addition to any other treatment.* That statement applies, in addition to collapse measures, more especially to surgical procedures and recent drug therapy. All too many patients are given pneumothorax or phrenic nerve crush and then allowed to go home for a "few days' rest before going back to work," after which they come in for refills or obtain refills from a "panel" doctor in a clinic. Such treatment cannot be condemned too severely. Of course some patients would get well in spite of the poor method—30 per cent get well without any treatment—but a large percentage are lost. The patient also obtains a false sense of security that is dangerous. He is not given the proper meaning of the treatment. A large percentage of such patients develop adhesions, fluid accumulation and spread of disease to other parts of the lungs. Then they are saved, if at all, only by years of treatment or radical operation.

So-called ambulant pneumothorax, therefore, can be a total failure if not properly supervised, yet in all pneumothorax the patient is ambulant at certain stages of the treatment. It is a matter of selection and timing, as was mentioned previously. Each patient must be followed closely. If acute infection develops, it must be treated promptly. The early use of penicillin to ward off a throat infection, bronchitis or pleuritis is justified for such patients. Particularly should pleurisy with effusion be avoided, because infections frequently lead to empyema.

It is not my wish to condemn office or clinic practice of pneumothorax, certainly not as an emergency measure or where there are no available beds. If it is employed as emergency treatment, good supervision can avoid all but a few complications, and if it is done in the office or clinic because of bed shortage, it is defensible as a makeshift to do the best possible.

Orrego's work in Santiago, Chile, where there was only one bed per ten deaths, is impressive. This resourceful physician instituted substations with temporary beds where patients could be housed for a few days after treatment until the acute symptoms wore off. Then other patients would take their places. By staggering the use of beds, the maximum results were obtained in a most unfavorable situation. The greatest danger in such a method is that the practice might become a permanent one and vitiate attempts to obtain better facilities when they can be obtained.

After the patient's condition has become stabilized, ambulant collapse therapy *may* be instituted. With intelligent application of principles and proper guidance of the patient as indicated before, the dangerous complications can be reduced to a minimum and the patient brought to a successful cure.

Each of the many other surgical collapse measures could be dealt with in the light of the basic principle expressed, but enough has been given to afford a rough pattern to follow. It is well to remember that basic knowledge is the foundation and that proper judgment of all factors is the superstructure of any treatment program.

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The Role of Bacteriologic Information in Controlling the Treatment of Pulmonary Tuberculosis

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SUMMARY

The role of information obtainable by bacteriologic examination in controlling the treatment of pulmonary tuberculosis is of first importance. Bacteriologic examination is not a substitute for roentgenography. Rather, it is a method companion to x-ray and clinical procedures, capable of providing information not otherwise obtainable.

A GOOD program of bacteriologic examinations of pulmonary excretions ranks with roentgenography as a guide in management of tuberculosis. Bacteriologic information is useful particularly where roentgenographic visualization is inadequate.

Roentgenography at its best and with the employment of all special methods is not infallible. As a rule and except with special techniques, not all of the lung tissue is visualized, particularly in the mediastinal region and behind the dome of the diaphragm. Lesions as large as 2 or 3 millimeters may not show. There may be difficulty in the interpretation of the summation of superimposed shadows. Whether or not the disease is active is not always determinable, especially when a series of x-ray pictures is not available.

One kind of case difficult of interpretation is that in which there has been more or less healing. Fibrosis, atelectasis and pleural thickening obscure the picture. It may be impossible to tell whether healing, either by fibrosis or calcification, is complete or partial. It is frequently not possible to determine whether treatment is needed or when sufficient treatment has been given.

Roentgenography is especially at a disadvantage in appraisal of collapse therapy. X-ray pictures will show the extent of collapse, the presence of adhesions and pleural reactions; and usually the actual closure of cavities is observable roentgenographically. In the latter instance, laminograms can be of help. But often it is impossible to know just what the situation is within the collapsed lung. While it is not usual for cavities to remain open without detection, this does happen. The condition of the tuberculous tissue not grossly ulcerated frequently remains obscure. During the whole period of collapse one may be relatively ignorant of what is going on within the lesion. The extent of healing is often not revealed. The effective degree of pneumothorax is often not known. It is not possible to tell without question when pneumothorax can be safely terminated or when the collapse procedure used is inadequate. Determination of the condition of the lung under a thoracoplasty by x-ray is particularly unsatisfactory, even with grid or Bucky technique or with laminograms. Regenerating rib, scar, airless lung and hilar structures make up a conglomeration of shadows difficult to decipher.

From the Barlow Sanatorium, Los Angeles.

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BACTERIOLOGIC INFORMATION AS A GUIDE

By the persistent use of direct smear, concentration, culture and animal inoculation of multiple-day sputum specimens and fasting stomach contents, bacteriological diagnosis has been obtained in 97.4 per cent of clinically active cases of pulmonary tuberculosis,[3] and in 94.6 per cent of cases of minimal tuberculosis. If bacteriologic studies of this caliber be continued month by month, they become valuable not only in diagnosis but in the guidance of treatment. Only the simplest test necessary to demonstrate the bacilli need be done each month. As the output of the bacilli diminishes, the more sensitive tests are required. For the demonstration of rare bacilli or the proof of negativity, the author carries out culture and animal inoculation of pooled sputum specimens and stomach contents every third or second month, or, if indicated, each month. Follow-up tests after the patient is discharged are done at three, six, 12, 18 and 24 months and each year thereafter.

With this program, bacteriologic information serves as an indicator of the effectiveness of treatment—whether it be rest, lung collapse or excision —and it helps to tell whether further procedures are necessary. It helps also in determining when treatment may be terminated and when the patient can get up, begin to exercise, and go home or to work. The staff has come to depend a great deal on the results of examinations of sputum and gastric contents in making the decisions at each step in the treatment of patients. A patient who has no diminution of bacillary output on bed rest may be given pneumothorax. If tests are positive for tubercle bacilli after several months of this regimen, it may be considered ineffective and perhaps the collapse will be improved by cutting adhesions or by phrenic nerve paralysis. If the bacilli still are demonstrable after a reasonable period, thoracoplasty or even lung excision may be carried out. The results of chemotherapy are similarly evaluated.

Like radiographic visualization, however, information obtainable by bacteriologic examination is not an infallible guide. The "negative" case is not necessarily a healed case. The experienced physician knows that healing may require months or years even after the disappearance of the bacilli from the excretions. A closed lesion may reactivate.

On the other hand, "positive" results of bacteriologic examination do not necessarily indicate a bad prognosis. Many persons with stable lesions and a few bacilli in the sputum are capable of carrying on for years, leading relatively normal lives or following a slightly restricted regimen. A fair proportion of these patients will become "negative" in the course of time and achieve relative or complete recovery. Of such patients discharged from the Barlow Sanatorium, about 40 per cent eventually become "negative."[4] All patients are discharged to the care of a chest physician to continue treatment.

Yet under reasonable auspices patients whose sputum has been rendered abacillary have a better prospect of recovery than those remaining bacteriologically "positive." The treatment of pulmonary tuberculosis cannot be considered entirely successful so long as there are tubercle bacilli in the sputum. Bacillary output always ceases before healing is complete. Abeles[1] found that the patient in whom the disease was arrested or apparently arrested and who was discharged with occasionally "positive" cultures, was three times as liable to reactivation of the disease as the patient with completely "negative" sputum. Chang[2] reported the ratio of reactivation to be two to one. In a previous study[4] the author observed that the likelihood of a patient remaining bacillus-free in follow-up tests after discharge was directly proportional to the number of months excretions were "negative" before discharge.

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Monaldi Procedure

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MONALDI catheterization of cavities in the lungs has been in use at Arroyo del Valle Sanatorium since 1940. In a ten-year period it was employed in about 50 cases. At first it was applied in practically every case in which the following three factors were combined: (1) Cavity 4 cm. or more in diameter, (2) no pleural space, (3) symptoms and signs of cavity block. If positive pressure readings were obtained, a catheter was inserted into the cavity. Early in the use of the procedure, decision to apply it was guided largely by the presence of intractable cough and toxicity, but it was soon learned that a patient may have a cavity of the tension type yet not have the so-called "blocked cavity cough."

Contrary to Monaldi's experience, it was found that cavities that apparently closed did not stay closed. For that reason, thoracoplasty was carried out as soon after the Monaldi catheterization as the patient was in condition for the operation. As cutting the Monaldi tract in the course of thoracoplasty became almost routine, preliminary rib resection was done. At first this was done before the Monaldi procedure was started. In some cases, however, there was rib regeneration before the patient was in condition for thoracoplasty, and in others thoracoplasty never was carried out. Hence it became the practice to do anterior rib resection below the tube ten days before the first stage of thoracoplasty was scheduled. This schedule has been satisfactory in most cases, although the surgeon must bear in mind that the serratus cannot be freed from the ribs as in a routine operation.

Results in some cases in the series were unsatisfactory, owing to several factors:

1. Catheterization of non-tension cavities.
2. Multiple cavities in the same lung.
3. Transient blocking of cavities that became unblocked after the Monaldi procedure had been done.
4. Lack of instruction of patients and personnel in operation of the apparatus and care of the Monaldi tube.

The complications encountered were:

1. Hemorrhage. In one case it occurred at the time of the procedure when a surgeon who was not experienced in the technique missed the cavity in several attempts. In several cases, bleeding through and around the tube necessitated discontinuance.

2. Pneumothorax. In the case in which this occurred, fluid accumulated. However, adhesive pleuritis sealed off the pleural space and the Monaldi procedure did not have to be discontinued.

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3. Tuberculous meningitis. This occurred in two cases. In one case the complication developed late, just before thoracoplasty was to be started. In the other case the patient had bilateral disease, was in poor condition, and use of the Monaldi procedure was ill-advised.

4. Subpectoral abscess developed in one case on the same side as that on which the catheter was introduced. It occurred three years after thoracoplasty and closure of the Monaldi tract. The thoracoplasty had been inadequate — one-stage, without cavity closure.

5. Monaldi tract cut at time of thoracoplasty. In all cases in which this occurred the patients recovered.

Although early experience was not good, better guides for the selection of candidates for the procedure have led to satisfactory results in cases of specific type. Monaldi catheterization is now restricted to cases in which any of the following conditions exist:

1. Positive pressure cavity with toxicity that does not respond to treatment with para-aminosalicylic acid.

2. Blocked cavity in a case in which the condition of the bronchus contraindicates resection.

3. Blocked cavity in a case in which the bacilli are streptomycin-fast.

4. Bilateral disease with blocked cavity at the apex of one lung.

If the Monaldi procedure is to be used, streptomycin should not be given first because usually after the drug is administered the cavity decreases in size to the point that insertion of the catheter becomes difficult or impossible.

For treatment of blocked cavity, regardless of location, resection is the procedure of choice if the condition of the patient will permit. The Monaldi procedure is at its best only in cases in which the cavity is in an upper lobe so that thoracoplasty can be done over the diseased area. In cases of bilateral disease, draining a blocked cavity in one lung often will result in improvement in the other. In some instances this result will have the effect of so far redeeming "hopeless" cases that definitive therapy ultimately will arrest the disease.

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Extrapleural Pneumothorax

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SUMMARY

Extrapleural pneumothorax is a valuable method of treatment of pulmonary tuberculosis. However, it is applicable in a relatively few cases which meet stringent criteria. Moreover, it entails the absolute necessity for continuity of care following operation. Within these limitations, the procedure will control tuberculosis in a small but significant number of patients.

EXTRAPLEURAL pneumothorax is an operation with distinct advantages and disadvantages. Advantages are that it is a one-stage procedure entailing minimal operative hazard with little shock, it does not often cause spread of infection, and no deformity results from the operation. The reduction in pulmonary function is small, which makes the operation of distinct value if lesions are bilateral. In theory, the operation should have a wide application in the surgical treatment of pulmonary tuberculosis, but in practice this is not so because of the disadvantages which amount practically to contraindications.

First, use of the procedure is limited to cases meeting sharply defined criteria. The disease should not have been present more than 12 to 18 months, with the lesion stabilized and productive. Pneumothorax must have been attempted without success, to make certain that the pleural space is obliterated. No cavity should be more than 3 cm. in diameter and all cavities should be surrounded by lung tissue. In extent, the disease should be localized and limited to the upper third of the lung field, which may include the superior segment of the lower lobe.

Extrapleural pneumothorax is not suitable in cases in which old fibrotic lesions with retraction are present. Giant cavities, tension cavities or cavities at the periphery of the lobe whose outer wall is at the pleura are contraindicative factors. The site of the lesion is important. Disease in the right middle lobe, the lingula or the basal segments of the lower lobe cannot be controlled by extrapleural pneumothorax. Ulcerative bronchitis is a definite contraindication.

A second and perhaps most important disadvantage is the necessity for meticulous and prolonged

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postoperative management. Experience has shown that continuity of care by one or at most two persons is paramount. This limits the performance of the operation to an institution in which such continuity of care is available and further limits the choice of patients to those who are emotionally stable and are not likely to wander.

It is emphasized that extrapleural pneumothorax is not a substitute for thoracoplasty. In the prestreptomycin era, it was occasionally used earlier in the course of the disease than thoracoplasty was thought to be safe, but that situation no longer obtains. The author prefers extrapleural pneumothorax primarily in situations in which a less extensive procedure than multi-staged thoracoplasty probably will be successful, for patients for whom freedom from deformity is desirable (children, adolescents and young women), and for patients with bilateral lesions.

In 1947, Smart, Samson and Childress[1] reported upon a series of 52 operations in 45 patients which had been done from five to nine years before the date of the report. Statistics from that report will be given briefly to compare with a more recent series of 29 operations on 27 patients done during the four-year period 1946 through 1949.

Of the original 45 patients, 31 (68.8 per cent of the entire group or 91 per cent of the living) were working and had sputum negative for tubercle bacilli. Three were lost to observation. Eleven (24 per cent) were dead. Of the 11, all but one died of progression of tuberculosis. The deaths were attributable in part to unsatisfactory operations but primarily to lack of cooperation by patients in follow-up care. In four cases (8 per cent) spread or reactivations of tuberculosis developed. Empyema developed in 18 patients, and it was controlled almost entirely by aspirations, irrigations, chemotherapy and/or oleothorax. Drainage was not carried out in any case. One patient had thoracoplasty (elsewhere) because of recurrent empyema. It is of importance that none of the deaths was caused directly by these infectious complications.

As regards the status of the pleural space five to nine years after operation, slightly over 50 per cent of the living patients still had oleothorax. In the remainder of the patients the space had been obliterated by reexpansion of the lung.

In the four-year period ending December 31, 1949, 29 operations were done on 27 patients. Seven of the operations were done a minimum of three years ago. There has been one death in this series: Three months following operation, a patient with extensive bilateral tuberculosis died. In one case there was postoperative spread.

Of the 26 living patients, 25 had sputum negative for tubercle bacilli after the operation. The one patient who at no time had sputum free of the organism had a poor pleural space because of extensive extrapleural adhesions which could not be safely separated. In that case thoracoplasty would have been more suitable because of the nature of the pathologic changes present, but the patient refused that operation as either an original procedure or a subsequent measure should extrapleural pneumothorax fail. A second patient again had tubercle bacilli in the sputum two years following operation; active tuberculous bronchitis was discovered and resection is now being considered at another institution. Twenty-four of the 26 living patients have sputum negative for tubercle bacilli by concentrate and culture. For those patients the span of time since operation ranges from three months to four years.

There were 28 operations on the 26 patients who are still living. Infection developed in three cases (10 per cent)—tuberculous in one case and nontuberculous in two. In none of the three cases was further operation necessary; the infection was controlled by aspirations and/or oleothorax.

Four (14 per cent) of the patients have been converted to oleothorax. In three cases this was done as an antisymphyseal measure, and in the fourth because the patient was uncooperative and would not come in for refills of air.

In three of the cases in which four years have elapsed since operation, the spaces have been obliterated by satisfactory reexpansion of the lung.

It is impossible to make an exact statistical comparison between these two groups because of the differing time intervals since operation, but in general it may be noted that in the later series the death rate was lower and the rate of conversion to bacilli-free sputum was higher. Spread of the disease occurred in 3 per cent of cases in the most recent series, as against 8 per cent in the first group. The incidence of infection in the extrapleural space was 10 per cent against 35 per cent, and as a consequence oleothorax was necessary in only 14 per cent of cases, against 50 per cent. It is probable that the routine prophylactic use of penicillin has helped decrease the pyogenic infection rate. Other factors were better selection of patients for the operation and, perhaps, minor improvements in operative technique.

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Frequency of Tuberculous Lesions Discovered at Autopsy at Los Angeles County General Hospital, 1918-1948

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ANALYSIS of the records of the 40,130 postmortem examinations performed at the Los Angeles County General Hospital during the past 30 years reveals many interesting findings. Throughout this time there have been approximately 50 per cent more males than females autopsied. Nearly one-sixth of the autopsies were on Mexicans and only one-fifteenth were on negroes. The proportion of negroes has nearly doubled, while the proportion of Mexicans is now less than half of what it was a generation ago and the proportion of white patients other than Mexicans has increased slightly. The age distribution has greatly changed. The median age at autopsy, which was 40 years a generation ago, is now in the middle fifties. Patients over 70 years of age, who constituted less than 10 per cent in 1918, now represent more than one-quarter of all of the autopsies.

Some of the changes in the composition of the autopsy population merely reflects changes in the population of the County of Los Angeles. Other differences are due to changes in the relative incidence and mortality from various conditions during this time. The ratio of deaths in the hospital to total admissions has averaged less than 10 per cent. Despite the increase in recent years in the age of patients at time of death, which reflects the changing age of the total population, there has been a slight decrease in this ratio. Autopsy has been done on more than 35 per cent of all patients who died in the hospital. This figure has increased from less than 20 per cent in the early years of the study to more than 40 per cent in the last decade. An additional 15 per cent of the patients who died have been autopsied by the coroner, so that altogether about half of all patients who died at the Los Angeles County General Hospital have been examined postmortem.

The decline of tuberculosis mortality rates in Los Angeles County during this time has been even more rapid than in the state or in the nation as a whole. However, owing to the continuously increasing population in the county the actual number of deaths from tuberculosis has fallen more slowly. There has also been an increasing use of hospital facilities for the treatment of tuberculosis. The number of beds on the tuberculosis service at the General Hospital has increased from less than 100 to more than 300 during this time. There has been an even greater increase in the number of beds for the care of tuberculosis in other institutions in the county. Approximately 4,000 beds are now available in tuberculosis institutions in Los Angeles County, or about four beds per tuberculosis death occurring here annually. The tuberculosis service at the Los Angeles County General Hospital comprised about one-quarter of all the beds for this purpose in the county at the beginning of the period, but now less than one-tenth.

As the entire hospital has similarly grown, the tuberculosis service has constituted about 10 per cent of all the beds at the General Hospital. The average length of stay of patients at the General Hospital in the tuberculosis service has increased during this time from about one month to three months, so that the number of admissions per annum on the tuberculosis service has shown relatively little change. The average duration of patients' stay on other services at the General Hospital has been only about two weeks and even this has diminished slightly in more recent years. Accordingly, the relative number of admissions on the tuberculosis service has declined from about 5 per cent of all admissions in the earlier years to less than 3 per cent of all admissions in more recent years.

Despite the reduction in the relative proportion of tuberculous patients to all patients admitted to the hospital, and to the total number of patients in tuberculosis institutions, and the pronounced reduction in the tuberculosis death rate in the entire community, the policy of admitting the more seriously ill tuberculous patients to the General Hospital has resulted in a relatively stable mortality rate on this service. Thus about 350 deaths from tuberculosis (or about a sixth to a third of all deaths from this disease in the county) have occurred annually on the tuberculosis service of the General Hospital throughout this period.

About half of the patients who were found at autopsy to have died of tuberculosis in the Los Angeles General Hospital died on services other than that of tuberculosis. This was due in part to deaths from tuberculous meningitis on the contagious disease service and to deaths of patients with nonpulmonary tuberculous diseases for which they had been treated on orthopedic, pediatric, or other services. Other tuberculous patients were cared for in the jail ward, on the pneumonia service or in other wards, despite known tuberculosis, because the tu-

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berculosis service lacked adequate bed facilities. Other patients, in whom tuberculosis was not recognized during their lives, were treated under various diagnoses on other services but were found at autopsy to have died of tuberculosis. These errors were balanced by cases in which the clinical diagnosis of tuberculosis could not be confirmed by autopsy findings. It appears, therefore, that about half of all patients who die of tuberculosis in Los Angeles County die in the Los Angeles County General Hospital.

The 3,635 patients who were judged, at autopsy, to have died of tuberculosis at the Los Angeles County General Hospital during the last 30 years constitute nearly 10 per cent of all the 40,130 cases in which autopsy was done during this period. Tuberculosis, found to be the cause of death in more than 25 per cent of all the cases in which autopsy was done during the first five years of the study, was the cause of death in less than 5 per cent of all the autopsies performed during the last five years. The excess of males over females in the number of patients found to have died of tuberculosis has been even greater than the excess of males in the total number of autopsies carried out.

The relative number of Mexicans showing fatal tuberculosis at autopsy has decreased greatly, from more than half of all cases in which tuberculosis was found at autopsy to be the cause of death in the earlier years covered by this study to less than one-quarter in recent years. The proportion of autopsies showing death due to tuberculosis in negroes has doubled during this time, so that white patient deaths still constitute little more than half of all the deaths here attributed, at autopsy, to tuberculosis. These changes have been due both to differences in the constitution of the population, and to changes in the relative fatality rates from tuberculosis in the different groups. Thus tuberculosis as the primary cause of death in the white patients autopsied dropped by more than 50 per cent in the last half of the period, or from more than 10 per cent in the first half to less than 5 per cent. Tuberculosis as a cause of death among Mexicans autopsied has declined precipitously, from nearly 30 per cent in the earlier years to less than 15 per cent more recently. Among the negroes, the relative decline in the death rate has been much less pronounced; the rate for the first half of the autopsy series was about 12 per cent as compared with 9.5 per cent in the latter part of the series.

There were great differences in the distribution of fatal tuberculosis in the population of different ages. In the cases in which autopsy was done, tuberculosis caused more than 10 per cent of all deaths under the age of one year in the earlier years studied, but less than 1 per cent in the later years. In the earlier years covered by this review, more than one-quarter of all tuberculous deaths were in the age group below 20; in the last few years, less than 2 per cent. On the other hand, whereas in the earlier years less than one-sixth of all tuberculous deaths occurred in patients over 50 years of age, more recently more than one-third of all tuberculous deaths have occurred in that age bracket.

In the course of 40,130 autopsies over a period of 30 years, there were 2,450 instances in which tuberculous lesions were observed and reported among the autopsy diagnoses but death was considered to have been attributable to non-tuberculous conditions. These 2,450 diagnoses of non-fatal tuberculosis represent only a small fraction of the total number of tuberculous lesions that actually existed at the time of autopsy. In general, they were the larger,

TABLE 1.—*Data on Tuberculosis Relative to Total Admissions, Los Angeles County General Hospital, 1918-1948*

	1918-37	Per Cent	1938-48	Per Cent	Total 1918-48	Per Cent
Admissions	622,599	....	545,540	....	1,168,139	....
Deaths	60,880	9.8	51,529	9.5	112,409	9.6
Autopsies	18,971	31	21,159	42	40,130	36
Male	11,640	61	13,046	62	24,686	61
Female	7,331	39	8,113	38	15,444	39
Caucasian	14,005	74	16,717	79	30,722	77
Mexican	3,568	18	2,429	11	5,997	15
Negro	1,133	6	1,785	9	2,918	7
Others	265	2	228	1	492	1
Age						
0-9	4,014	21	3,363	16	7,377	18
10	793	4	469	2	1,262	3
20	1,470	8	858	4	2,328	6
30	1,895	10	1,536	7	3,431	9
40	2,441	12	2,285	11	4,726	12
50	2,851	14	3,324	16	6,175	15
60	2,698	13	4,205	20	6,903	17
70	1,902	10	3,687	17	5,589	14
80 and over	596	3	1,431	7	2,027	5
Unknown	311	2	1	....	312	1
Autopsies showing tuberculosis	3,109	16	2,976	14	6,085	15
Fatal tuberculosis	2,250	12	1,385	6	3,635	9
Non-fatal tuberculosis	859	4	1,591	8	2,450	6

more conspicuous and more important tuberculous lesions in patients who died of other conditions, although the majority were considered inactive or non-progressive by the pathologist. Pleural adhesions were present in the majority of all autopsies performed during the earlier part of the study, and in the majority of the patients over 50 years of age in the later period. Most of these pleural adhesions were probably due to tuberculous disease, even though this was not often so recorded by the pathologist. Pleural adhesions, healed hilar tuberculous lymph nodes and minor scars and calcifications in the lungs were generally ignored in recording the diagnoses.

Although fatal tuberculosis has diminished greatly during this time, non-fatal tuberculosis has actually been observed more frequently in recent years. This has been chiefly due to the greater survival rate, as regards both tuberculosis and other diseases, and to the consequent increase in the average age of the persons autopsied.

In those cases in which non-fatal tuberculous lesions were observed at autopsy, 72 per cent of the subjects were males. Non-fatal lesions were found more often in other white patients than in Mexicans, or in negroes. This is in keeping with observations made elsewhere, and is only partially accounted for by differences in age distribution. The age at autopsy of persons with non-fatal tuberculous lesions is quite different from that of those who died of tuberculosis; non-fatal lesions were noted in less than 1 per cent of the patients under ten years of age, but in more than 10 per cent of those 70 years of age and over.

A relatively higher proportion of the patients with non-pulmonary tuberculosis complications and non-tuberculous complications of pulmonary disease were apt to be admitted to the Los Angeles County General Hospital than to the Olive View Sanatorium or various other sanatoria. The incidence of non-pulmonary tuberculous complications and non-tuberculous associated conditions in patients autopsied in this series may therefore have been somewhat higher than might have been expected in the total series of deaths from tuberculosis that occurred throughout Los Angeles County.

Altogether, 15,325 different diagnoses of tuberculous conditions were recorded in the 6,085 autopsies in which tuberculous lesions were noted, or approximately 2.5 tuberculous conditions per patient. In some cases only a single tuberculous diagnosis was recorded, but in other instances more than a dozen different conditions might be mentioned. There were 1,649 cases in which inactive pulmonary tuberculosis was listed. Evidence of the extent of hematogenous dissemination is the fact that there were over 900 instances of tuberculous meningitis, 597 instances of general miliary tuberculosis (many of them also included under meningitis), 734 diagnoses of tuberculosis of the liver and 838 of the spleen, 886 instances of urinary and 414 of genital tuberculosis, 219 of bone tuberculosis, and 181 instances of endocrine tuberculosis, chiefly adrenal.

There were 1,084 instances of lymph node or lymphatic tuberculosis, 1,077 of tuberculous involvement of the pericardium and pleura. 428 of the peritoneum and 25 of the skin, most of which may have been considered the effects of lymphatic dissemination or contiguous extension. Intracanalicular spread resulted in 1,551 instances of gastrointestinal involvement and 389 instances of involvement of the larynx, trachea and bronchi. Further analysis of the distribution of tuberculous lesions in different parts of the body, and the channels of such distribution, and of the frequency with which various conditions were associated with eventually fatal tuberculosis or death from non-fatal tuberculous causes may reveal other interesting findings. The changes in the distribution of lesions and of the fatality rates associated with them, in the course of time reflect changes in the disease and in treatments used.

TABLE 2.—*Tuberculosis in Los Angeles County General Hospital Autopsies*

	Fatal Tuberculosis						Non-fatal Tuberculosis					
	1918-37	%	1938-48	%	Total	%	1918-37	%	1938-48	%	Total	%
Total	2,250	100	1,385	100	3,635	100	859	100	1,591	100	2,450	100
Male	1,430	63	932	65	2,362	65	607	72	1,149	72	1,756	72
Female	820	37	453	35	1,273	35	252	28	442	28	694	28
Caucasian	1,068	46	785	57	1,853	51	671	79	1,356	85	2,027	83
Mexican	963	45	378	27	1,341	37	133	15	118	7	251	10
Negro	137	6	169	12	306	8	43	5	89	6	132	5
Other	82	3	53	4	135	4	12	1	28	2	40	2
Age												
0-9	389	17	163	12	552	15	20	2	7	....	27	1
10	207	9	65	5	272	8	15	2	11	1	26	1
20	469	21	196	14	665	18	43	5	30	2	73	3
30	375	17	240	17	615	17	73	8	98	6	171	7
40	317	14	226	16	543	15	125	14	155	10	280	11
50	195	8	213	15	408	11	194	23	294	19	488	20
60	148	6	190	14	338	9	179	21	421	26	600	24
70	70	3	64	5	134	4	143	17	405	25	548	22
80 and over	19	1	28	2	47	1	49	6	170	11	219	10
Unknown	61	3	....	0	61	2	18	2	....	....	18	1

Extensive, detailed tabulations of the various forms of tuberculosis, and of combinations of tuberculosis in different parts of the body, as well as the association of tuberculous with non-tuberculous disease, as observed at autopsy, have been carried out. It is hoped that before the end of another year, these tabulations may be completed. Study of the incidence of tuberculosis and other lesions at autopsy may lead to greater ability to recognize factors that may be associated with susceptibility to infection, disease and resulting death. This in turn may bring greater ability to interpret the factors affecting these changes and to devise measures which may accelerate the eradication of tuberculosis.

The Present-Day Usage of Pneumothorax in the Treatment of Pulmonary Tuberculosis

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SUMMARY

The patient with tuberculosis must heal himself. Collapse measures help in the healing process by making the environment of the tubercle bacilli in the lungs more intolerant of multiplication and spread. The usage of pneumothorax has decreased; ten years ago it was used for over 50 per cent of patients, now for less than 10 per cent. This reduction in usage is not a condemnation of the procedure but an index of the more judicious aplication of the treatment as adjuvant to other accepted forms of therapy. Pneumothorax, because it is so versatile and flexible, lends itself most effectively to combination with other collapse procedures. Its use for well selected purposes is still indicated, but in much more narrow limits than previously applied.

THE patient with tuberculosis must cure himself. The final conquest or destruction of the tubercle bacilli is a victory of the body itself. Physicians guide and assist the resisting forces of the diseased body against the rapid multiplication and spread of the invading germs. The general measures of rest and good nutrition remain basic in the treatment. All measures of collapse therapy are clumsy and extravagantly inefficient; the more involved the procedure, the more expensive it is in functional loss to the patient. The ideal cure of any disease is the total eradication of it with the least resulting loss of function of the involved tissue or organ. Measures of treatment should be selected and applied with this always in mind. After all, surgical measures involving resection of parts and permanent loss of functions, in varying degrees, represent defeat of medicine. This is not the fault of the surgeon. It is more the fault of the physician and of the limitations of medical knowledge which permit the disease to go on unprevented and undiagnosed until it has reached such stages as demand the serious loss of function to win life.

Surely all physicians are looking forward to the day when all collapse measures can be described as clumsy methods of the past, rather than to the continued development and refinement of more procedures entailing removal and loss of function, even though the technical accomplishment carries credit and glory. Research for the accomplishment of cure of tuberculosis is and must remain in the realm of prevention, of early diagnosis, and of specific bactericidal agents to stop the development of such stages of disease as require collapse therapy. Yet, until those goals are achieved, the measures which must be utilized to save life, clumsy as they may be, cannot be abandoned and efforts to improve them must continue.

Pneumothorax, as a treatment for pulmonary tuberculosis, has had wide usage all over the world for over 40 years. No other active definitive method of treatment has had such universal application. Surely such long usage by physicians of all beliefs, opinions, and convictions as regards rest, climate, specific cures, surgical procedures, and psychosomatic attitudes must have brought out the good and evils of the treatment. When pneumothorax was introduced as a form of treatment, it was the only method of collapse therapy known. It was first received with misgivings, damnations, and limited application; it was first applied in hopeless cases when rest, food, and climate had failed. Gradually, a safe, sane level of application was found, but still its advantages were pushed and extended into the zone of hazards and uselessness because many times there was no other treatment to offer and trial was justified. This era, extending into the time of the perfection of thoracic operations, was padded with overuse and misuse of the treatment. But the recog-

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nition and limitation of the wrong use have not eliminated the proper use nor changed the acceptable proven indications.

The patient well chosen for treatment with pneumothorax is one in whom the tuberculous lesion is of such character and position that the extra relaxation of the involved tissue, brought about by the air in the pleural space, will hasten and make more certain healing with minimum destruction and permanent loss of function. There can be no hard and fast specific general rules of choice. The selection may depend upon the patient himself, his race, color, temperament, and his ability or willingness to take rest. The quality of lesion should be such that a considerable part of it is exudate capable of being absorbed or of healing with minimal scar. Any cavity present (and most often cavitation is demonstrable by x-ray studies) should be of such character and position as will permit of closure by relaxation of the surrounding lung tissue. Sputum positive for tubercle bacilli may be accepted as evidence of necrosis and ulceration, even though no cavity is observed on x-ray films. In the area to be collapsed, there must be no accepted evidence of bronchial obstruction which cannot be relieved. The significance of bronchial lesions in the area, as far as determining the usage of pneumothorax is concerned, has been considerably changed since the advent of streptomycin and other new drugs into treatment. Likewise, the method of dealing with that type of thin-walled cavity which indicates bronchial obstruction, has been altered with the use of the newer agents.

Bed rest should be given thorough trial before pneumothorax is considered. Bed rest for three months to study the ability of the body to cope with the lesion should be the rule before pneumothorax is undertaken, unless circumstances develop which unquestionably threaten the life of the patient or indicate unequivocally in less time that bed rest alone is not adequate. Now, for each patient it must be decided whether or not streptomycin or others of the new drugs shall be added to bed rest in this period. At the end of three months of observation and treatment, all clinical, laboratory, and x-ray findings must be studied to determine whether the healing process is adequate or further help is necessary. Experience has taught certain critical lessons and contraindications. Years ago, a study of the use of pneumothorax in cases of exudative lesions was made at the Dunham Hospital. The review clearly showed that the institution of pneumothorax in patients with exudative lesions and having toxic manifestations was extremely hazardous because of the high incidence of empyema. It is noteworthy, however, that in that institution there was a large proportion of negro patients. Most negroes with tuberculosis have exudative lesions. Therefore, in the Dunham series a relatively large number of the patients who had lesions of a nature suitable for pneumothorax were of a race for which the operation has proven less successful. By withholding pneumothorax in cases in which there are toxic manifestations, the medical staff at Dunham has greatly reduced the incidence of empyema in connection with the procedure.

Streptomycin and other new drugs have greatly reduced the time necessary to overcome toxic manifestations and have made the use of pneumothorax safer than ever in such cases. Despite these precautions, however, results of pneumothorax for negroes are not as good as for white patients, and the hazards are greater. While the hazards are also greater for patients with diabetes, who as a rule have exudative lesions, the judicious use of insulin and streptomycin makes the procedure safer and more effective.

The Dunham Hospital has a patient capacity of about 480. It is always about 90 per cent full. On the average, about 33.3 per cent of the patients are negroes. Previous to 1940, pneumothorax treatments were given to more than 50 per cent of all the patients. In four consecutive years, 1936 to 1940, there were 898 patients treated with pneumothorax. In those four years, 112 cases of tuberculous empyema developed. In 1944, 115 of 444 patients had pneumothorax treatments. Twelve of the 115 had bilateral pneumothorax. Empyema developed in eight (6.9 per cent) of the cases in which pneumothorax was started. The procedure was considered to be mechanically and therapeutically successful in only 37 (32.1 per cent) of the cases in which it was started. At present there is an adult census of 470 in the hospital. Pneumothorax treatments are being given to 32 patients (6.9 per cent). The more critical selection of cases is indicated by the fact that of the 32 cases in which pneumothorax is being given, the treatment is considered mechanically and therapeutically effective in 28 (87.5 per cent). There is one case of bilateral application. Only two cases of empyema have developed, and one of these followed spontaneous pneumothorax and bronchopleural fistula. Of these 32 patients, ten (31 per cent) are negroes, which is about the same as the percentage ratio of negro to white patients in the hospital. Further evidence of the drop in usage of pneumothorax treatments is that in Cincinnati in 1940 there were operated at the General Hospital two pneumothorax clinics a week, with an average attendance of 30 patients per clinic. Today there is one pneumothorax clinic a week at the Health Center, with an average attendance of 15 patients. This represents a drop of 75 per cent. The usage in private practice has had a corresponding turn. The author looks upon this downtrend as indicative of a more critical, refined choice of cases for the use of the procedure. Its overuse and misuse are no longer necessary, because other methods of collapse by pneumoperitoneum, phrenic nerve crush, and thoracoplasty, and total resections of diseased lung can be safely and judiciously used where pneumothorax is no longer the prime choice of treatment. The abuse is gone and the proper use becomes a part of the entire strategic plan of treatment in

which many procedures must be considered and used alone or in combinations.

The probable effectiveness of pneumothorax in a given case can sometimes be quickly determined by x-ray studies soon after the air is introduced. If the lung is completely surrounded by air, with no pleural adhesions and the involved tissue area is shown to be relaxed with evidence of cavity closure, good results seem probable. On the other hand, if there are broad adhesions overlying the lesions, preventing relaxation of tissue or cavity closure, the procedure is not likely to be effective. Between these limits are all gradations of conditions involving position, size, and character of cavity, a lesion incapable of compression, or adhesions of differing position, number, and quality. Each patient must be studied individually, which may entail thoracoscopic observations and a period of trial to observe the effect of continued treatment. The procedure can always be modified or stopped.

The accumulation of fluid in the pleural space during pneumothorax treatments is a problem which has provoked answers of wide extremes. Some physicians would stop the pneumothorax at the first hint of fluid. Others are more tolerant of such accumulations. It is known that fluid in small amounts comes and goes in about 25 per cent of all cases of long-continued pneumothorax. Individual experience and circumstances of treatment no doubt establish the practice of each physician. It is probable that those who in private practice give large numbers of pneumothorax refills in the office, have a much more lenient attitude toward fluid accumulation than do physicians in institutions. All agree, however, that fluid persisting for weeks, increasing in amount or becoming increasingly turbid or bloody, or giving rise to established toxic signs, or showing evidence of pyogenic nature by microscopic or bacteriological studies, calls for termination of pneumothorax. Of course, the transitory presence of fluid after certain procedures, such as pneumonolysis, must be taken into consideration.

At times, circumstances compel continuance of pneumothorax in cases in which it is not fully satisfactory and effective—cases in which bed rest has proved to be inadequate. The cavity may remain open and the sputum positive for tubercle bacilli. Many physicians, however, have had the experience of seeing such a cavity close and the sputum become bacilli-free after the "ineffective" pneumothorax has been abandoned. Explanation is inadequate, but it may be postulated that the short-term relaxation of lung brings about, in such cases, sufficient absorption of exudate and tissue change to permit the cavity to close on reexpansion. In fact, an adhesion may have held open a cavity which will close when the surrounding inflammatory changes have disappeared. This phenomenon, rare though it may be, only illustrates the flexibility in the usage of pneumothorax. A cavity in the lung is not feared simply as an anatomic hole, but because it usually offers an environment—extra moisture, extra oxygen, less blood supply, less movement—in which the tubercle bacilli can live and multiply. From this thriving focus, there are open bronchial avenues of spread to other parts of the lungs, and out of the lungs to trachea, larynx, mouth cavity, stomach, and intestines. A continuously sterilized cavity would do no more harm than reduce function by loss of tissue. For this reason no effort should be spared in search for methods and means to sterilize permanent cavities.

The time for voluntary termination of pneumothorax is a question often discussed and variously answered. Often the answer is forthcoming and dictated by natural progress of events. The lung gradually expands, the normal part first, then the involved part, until the pneumothorax space becomes at last so small that the treatment must be stopped. It is to be hoped that this foreclosure process will be orderly and delayed to such time as will have allowed the lesion to become inactive, the cavity closed, and the sputum negative for tubercle bacilli. The time necessary for this is one to three years, in the best of circumstances. In those cases in which the indication for discontinuing pneumothorax is less clear-cut, judgment based on x-ray study of the reexpanding lung and on sputum examinations must dictate the stopping point. Experience has taught that if pneumothorax is too long continued, the lung may become incompletely expansible. This can best be avoided by watching the ability of the lung to expand and contract and the thickness of the visceral pleura. After these anatomic pathological points have been settled to the physician's satisfaction, the patient's willingness, ability, and opportunity to carry on with extra rest and physical limitations must be weighed in the final decision.

Among physicians treating tuberculosis there is uniform agreement that pregnancy in a patient with active pulmonary tuberculosis in whom the disease is well controlled by established methods of treatment offers no serious hazard to life or to the expectancy for recovery. On the other hand, if the disease is not controlled, then pregnancy is a definite hazard to recovery and to life. The occurrence of pregnancy may be a circumstance which calls for extra active treatment in a patient who has been doing well on bed rest regimen. If in such circumstances a lesion is not completely controlled, some form of collapse therapy may be necessary. Pneumothorax, if it can be effectively induced, then is the method of choice because of the adaptability and flexibility of application. The disturbance of respiratory function is temporary; it can be modified and stopped at will. Surely an active lesion, especially with cavity, or a lesion not completely stable, is given added protection and the chance of continued control is improved by effective collapse with pneumothorax in pregnancy, especially during labor and following childbirth when the position of the diaphragm is so suddenly and greatly changed.

The treatment of pulmonary tuberculosis is not a skirmish, not a battle, not a siege, but a long-

drawn-out war with activity on many fronts. When treatment is started it must be based on strategic plans to suit the patient for a duration of at least five years, and maybe for a long lifetime. The plan must be to stifle and eradicate the infection while preserving at a maximum the function of the diseased part. Extensions of the disease and complications in other parts of the lungs and other parts of the body must be dealt with quickly and as fully as possible. It is necessary to be in a position to change, modify, enlarge, combine, or stop the methods of treatment in use (if necessary and if possible) at any time, to meet new situations. Pneumothorax is the most flexible and versatile method of collapse therapy that can be applied. It can be lessened, enlarged, shifted from side to side, applied to both sides, combined with any other form of treatment — rest, drug, antimicrobic, or surgical — or stopped at will. It can sometimes be stopped and restarted with surprising effectiveness. A treatment which has had such long and widespread effective usage, the value and limitations of which have been determined, is not one to be dropped. Rather, it is one to be preserved and utilized in better refinements of application so as to avoid abuses. It is to be used in its greatest effectiveness in combination with all other forms of treatment, with no undue claims made for accomplishments with it alone. As progress is made in methods to prevent tuberculosis and to diagnose and treat it early when it does occur, the goal is minimum sacrifice of tissue or function. Progress toward that goal will eventually reduce the need for the clumsy methods of collapse and resection which now must be used; and the last of these methods to be abandoned will be the flexible, versatile pneumothorax, narrowed more and more in its application but effective to the last well chosen case.

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The Pathogenesis of Tuberculosis as an Ebb-and-Flow Struggle Between Two Variable Antagonists

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THE pathogenesis of tuberculosis has become clarified over the last few decades so that we now may view the struggle between the host and the parasite as we would any contest where the stakes are survival of one or the other of the antagonists. Until recent times, however, knowledge was meager. Little by little, men like Bayle and Laennec parted the curtains on some of the elementary features of the tuberculous process.

Bayle was first to describe the miliary tubercle as a small "gray granulation." Laennec observed that many miliary tubercles had soft yellow centers and that they seemed to become larger as they became older. He reasoned that Bayle's hard gray granulations were merely the "green fruit" while the yellow miliary tubercles were the "ripe fruit." This is probably the only error committed by the immortal Laennec. He was not wrong, however, in his contention that all forms of tuberculosis were due to one cause. Too much tribute cannot be paid to his keenness of insight into the pathologic character of the disease. With much more information at hand a half century later, Virchow tried to tear down Laennec's unity theory, but only confused the scientific world for a time by his fallacious "dualism," a doctrine proclaiming that tuberculosis was a dual process of inflammatory phthisis and the tumorous tuberculosis. As a result of the enthusiasm for this contention Niemeyer made the preposterous statement that the worst thing that could happen to a phthisical patient was to become tuberculous. Virchow's influence held great sway throughout the latter part of the century. Fragmentary knowledge was added, such as that of Küster's epithelioid tubercle, Langerhans' giant cells, Reinhardt's caseous pneumonia and Weigert's intravenous tubercles. Parrot and later Küss laid the groundwork for the present understanding of primary tuberculous infection. These observations were made before the discovery of the tubercle bacillus; afterward in rapid sequence came the works of H. Albrecht, E. Albrecht, Ghon, Ranke and others, amplifying Parrot's pioneer studies. Since then dozens of names have been added to the list of investigators, and many theories have been proposed.

It is the desire of the author here to by-pass much that has been written and go directly to the most fundamental aspects of pathology and pathogenesis of tuberculosis. This will involve a consideration first of the host, secondly of the bacillus, then of the two in active encounter with each other, followed by a discussion of the resultant forms the disease may assume.

In few if any other diseases do we meet such a variable pattern as presents itself in tuberculosis. The process may be infinitesimal, one of limited involvement that heals promptly; or it may be over-

From the Research Laboratories of the Municipal Tuberculosis Sanitarium, Chicago, Illinois.

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whelming and rapidly fatal, depending on a multitude of factors, including age, sex, and race of the host, and type, nature, virulence and dosage of the bacilli. There may be an "ebb and flow" due to many "accidents" as proclaimed by Krause, who stated that "in the last analysis clinical tuberculosis is the fruition of numerous accidental circumstances." Trauma, a debauch, an illness, fatigue, mental anxiety—any of these may upset the delicate equilibrium between healing and progression. On the other hand, the development of special features of the bacillus may also lead to a breakthrough of the host's defenses and spread of the disease.

Let us visualize first the recently infected host. The infection runs its course, producing the well known acute inflammation, followed on the one hand by gradual recession and healing, or, on the other, by varying degrees of progression. In the healing process suffice it to say that humoral and cellular elements isolate the bacilli, encapsulate them, and ultimately destroy them in the caseous and calcified tubercle.

Before the interruption of this healing mechanism is discussed more at length, it must be noted that bacilli entering a previously so-called "virgin soil" have less inhibition than those entering a previously infected host; Krause,[6, 7] Willis,[20] Smithburn,[14] Sabin[12] and others demonstrated this point in animals. These investigators found that there is a prompt spread of bacilli by the lymphatics to the bloodstream and throughout the body. If in such cases the numbers of bacilli are great, the result may be a fatal generalized infection. Usually the generalization is slight and most of the bacilli are carried to distant tissue where they are destroyed.

The lesions at the local site and in the adjacent lymph nodes, however, go through an evolutionary development, involving the formation of a nebulous infiltrate, followed by encapsulation. The tissue cells begin to develop a sensitivity to the many proteins elaborated by the bacillus, especially to tuberculin. The cells are injured by the newly forming toxins and many of them die. Necrosis sets in, the cells in the center of the process caseate and disintegrate, and a wall of modified monocytes (epithelioid cells) gathers around the outside of the central caseous mass. These epithelioid cells may form a primitive capsule to wall off the central core of bacilli, or the caseation may spread, depending on the quantitative amount of sensitiveness, or "allergy," as it was originally called by Pirquet, and the other factors previously mentioned.

There is at about this time another change in the cellular response, also associated with the amount of hypersensitiveness. Along with the monocytes and other cells present in the early process, polymorphonuclear cells begin to appear in greater number. The result is more liquefaction and more caseation. There is a complex relationship between the factors of sensitivity, immunity, and rate of healing. In general it may be stated that the disease process will probably remain benign if healing of the lesions has progressed sufficiently and if sufficient immune factors have appeared before the appearance of an overwhelming allergic reaction or other deleterious factors.

It is conceivable and probably true that there are great differences in various infected areas; in one place healing may be taking place and in another rapid caseation may occur. If such rapid caseation happens to progress through the wall of a pulmonary vein, through the capsule of a lymph node into a bronchus, into the pleural cavity, into lung tissue, or even through the capsule of a newly formed tubercle, a rapidly forming process may result. In some instances bacilli pour through these "flood gates" to produce fatal disease. It is the suddenness and extent of these accidents that lead to their seriousness. The body is not prepared to meet such a catastrophe, the result being an overwhelming allergic response with widespread inflammation.

In infants and young adults the tendency for softening to occur around the tubercles seems to be more prevalent than in other age groups. There are growth factors and perhaps other anatomic-physiologic complexes that limit the fibrosis in the primary tubercles and as a result there may be a greater tendency toward liquefaction permitting the walls of newly formed tubercules to break more readily. Instead of becoming healed foci, the tubercles are prone to develop as small ulcers from which extension of the disease may take place. Thus the age of the host plays an important role in determining the character of the infection and, sometimes, the outcome of the disease process.

The same reasoning may be applied to other differences in the host—differences in sex, race, state of nutrition, and in the presence or absence of associated diseases. Frequently a complex of unfavorable factors acts to accelerate the disease process.

Now to a consideration of the parasite—the tubercle bacillus. Although there are probably almost as many variables in the parasite as in the host, they are not easy to detect and must usually be determined by indirect evidence.

One of the most striking features of the tubercle bacillus is it ubiquity. The bacilli or closely related forms exist as parasites in nearly all animal species. Insofar as man is concerned, there are only three important types—the avian, bovine and human. The avian differs widely from the human strain but the bovine is so similar that some investigators believe the one evolved directly from the other and would class the two together as mammalian. Within the human strain alone, however, there are wide variations in virulence, morphologic factors, and biological characteristics, all of which may be reflected in the effects on the host.

In studying morphologic delineations, Koch observed granules resembling spores, but he quite properly attached only academic importance to them. Metchnikoff noted branching; Spengler noted dispersions of nuclear material in fine granules; Much described four kinds of non-acid-fast forms

found principally in old and healing lesions; Arloing,[1] Vaudremer,[19] Valtis,[18] Ferran[2] and others described rapid-growing non-acid-fast variants; Mellon,[8, 9] and Kahn[5] described what they thought were life cycles.

This whole array of extraordinary phenomena, including others not mentioned, is too extensive to be passed over as of no importance. There is surely some meaning to all these variations from what seemed to be the prevalent or common manifestations of the tubercle bacillus. To one who has worked only with cultures of the bacilli the validity of many of the observations might be questionable. However, working over a span of years with all kinds of pathological material, the author has come to believe in practically all the observations reported, although not necessarily in the interpretation of the phenomena. Furthermore, the author has made some pertinent observations, some of which will be described here.

First, with regard to granules, the author has observed within tubercle bacilli granules ranging in size from huge central spore-like bodies to smaller bipolar bodies on down to innumerable nuclear acmulations along the bodies of the bacilli.[16] These observations have been confirmed by others using the electron microscope. The significance of the phenomena is an unsolved problem; whether these nuclear accumulations are an atavistic tendency to form spores or are part of a life cycle or something else, is still unknown. However, it would be logical to suppose that since the tubercle bacillus is probably, biologically and geologically, a recent adaptation from the plant world, the phenomenon of granules is an atavism of spore formation. It may be due to a reversion occurring occasionally in the normal development of the parasite or it may be a response due to the pressure of an unfavorable environment.

In addition to observing these granules, the author carried out studies to try to solve their meaning. By treating the material from animal or human organs in different cultural environments and watching the results under the dark-field microscope, and by making special stains at intervals, the granules were found to elongate directly, bud, or enlarge into doughnut shapes which, on opening, formed horseshoe shapes and, ultimately, straight bacilli. An interesting feature of this phenomenon was that it was observed with practically all sizes of granules. On one occasion recently this phenomenon was observed in material aspirated from the bronchus of a child.

It may be stated, probably as an axiom, that a truly ideal environment for growth of the tubercle bacillus does not exist. It is known that under certain experimental conditions a certain rather constant result can be obtained. There are variations, however, even within all of these ideal conditions, as all who have worked with H37 and BCG can testify. But it is a far cry from this "most ideal" environment to all the situations which different strains of tubercle bacilli encounter in the living body. As the author has stated in earlier writings, it is the difference between a pugilist shadow-boxing and one actually fighting an opponent. All the weak points of growth are tested in the many animal species, in the many organs of the different species with their great growth-producing differences, and in the individual cases where there may be rapid spread of the disease, a slow healing, or a back-and-forth struggle as the host and parasite contend for advantage.

This raises the question of the biological optimum size of the tubercle bacillus. A size of 0.5 to 0.7 micron in diameter by 2 to 10 microns in length seems under usual conditions to allow optimum absorption of nourishment, and ideal resistance to deleterious factors, thus providing conditions for the best possible growth. Under favorable conditions in culture and animal host, then, the bacilli are normally found within that size range. In other circumstances the bacilli may vary and occasionally develop granules of varying size from those barely visible under the usual magnification to oversized and ill-shaped forms.

Another observation made by the author is with regard to the regeneration of some of the granules into normal bacilli. In one instance, using the Peterfie method, a single large granule was selected and from it was grown a culture that produced ordinary tubercle bacilli. Also, in smears of growing cultures, small microcolonies of acid-fast granules appeared. Stains made at later intervals revealed the emergence from these microcolonies of small bacilli, at first extremely minute but later assuming a normal size. This observation was made only twice, but it was so striking that the author believes it is what Spengler saw in his "splitter" forms.

Another variation of the tubercle bacillus pertains to its staining qualities. Anyone following the growth on liquid media has noticed how the fresh "skin" that grows out is at first non-acid-fast and how, as the culture ages, the bacilli gradually take on acid fastness. Arloing, Ferran and others claimed to have "captured" some of these rapidly growing forms and kept them growing as non-acid-fast forms or weakly acid-fast forms. This observation, difficult to prove, seems biologically possible.

In the author's work, it was observed at one time that certain of the huge granules referred to developed into non-acid-fast, non-virulent tetrads. The reason for feeling that these were degenerate forms was that there was a gradual disappearance of the acid fastness of the parent granules as the tetrads formed.

The phenomena just described seem to support the idea that degenerate forms may emanate from tubercle bacilli under certain of the innumerable environmental conditions possible within the animal host. As an idea to think about along this line, the causes of sarcoidosis, Poncet's rheumatism, and some acute non-specific phases of tuberculosis might possibly be attributed to one of these variants that

has lost the characteristics of the tubercle bacillus and yet is able to produce disease in a suitable host or aggravate an existing disease process.

There are also changes of virulence and appearance produced by the specialized environment of certain body tissues. Griffith's[4] work on bacilli recovered from skin lesions has borne out the fact that practically all tubercle bacilli obtained from these lesions are atypical; about a third cannot be classified as human, bovine, or avian. It is a well known fact that bone and gland lesions frequently harbor a different type of bacillus than is obtained from ordinary lesions. Likewise genito-urinary lesions produce bacilli that tend to grow differently and are more prone to produce generalized disease and meningitis.

Another aspect of the germ should be mentioned, that of gross colony morphology and the differences in virulence manifested by the rough- and smooth-growing forms. Practically every strain of tubercle bacillus has been broken down into rough and smooth variants.

Another feature is chromogenesis. It is difficult to prove that chromogenesis develops in tubercle bacilli but it is equally difficult to prove that some of the chromogens are not variants of tubercle bacilli. It has commonly been observed that typical-appearing colonies of bacilli grown from sputum will turn yellow or orange in old cultures or only after exposure to oxygen. Pinner[10] passed many of these forms through animals and found a few strains were considerably virulent.

Finally, there is unequivocal proof of biological variations of tubercle bacilli in acquiring resistance to antibiotic and chemical drugs. Especially is this true of response to streptomycin. A striking feature is the wide variation of resistance in different strains of bacilli. The suppressive effect on the tubercle bacilli of the various drugs has not been entirely explored, but when such unfavorable effects are brought to bear, it can be expected that many signs of bacterial deterioration and degradation will be found. One of these appears to be an increase in chromogenesis — with and without virulence.

The two antagonists have now been introduced, with an indication of their respective strengths and weaknesses. In actual combat there is an interplay of the many factors known and perhaps of an even greater number still unknown.

In the disease process many individual bacilli or strains of bacilli are destroyed, with local or general healing; others acquire resistance and become more virulent, with exacerbation of the disease. The host may develop a high sensitivity locally or generally, allowing a break in the line of defense. Hosts of varying age, race, sex and under innumerable environmental conditions are in combat with a variable parasite. In addition, the factor of dosage of bacilli plays a vital role. The result is protean tuberculosis with all its ebb and flow from healing on the one hand to death on the other.

As a means of understanding better this whole struggle, it is helpful to group the various factors of host and parasite at two extremes of a chart. On one side are arranged all the favorable factors for a cure of the disease in the host, and on the other are the unfavorable factors which favor a progression of the disease. The "ideal" host would be a male of a resistant race, in the prime of life, in good health, and in pleasant environment of living and working conditions. The "ideal" parasite, from the standpoint of the host, would be one of the less virulent strains of bacilli, in small dosage, and susceptible to the many environmental factors. The disease which results from the combination of these two groups may be put on the left side of the chart, where also are listed the types of benign and healing disease that have been described in the past. For example, Bayle's gray granulations probably result from a scattering of bacilli of relatively low virulence within a resistant host having a "favorable" type of allergy. The nodular lesions called Simon[13] foci are those arising from a few clusters of bacilli, but having produced a rather large fibrocaseous, hematogenous type of lesion. The foci of Puhl,[11] Stefko,[15] Ghon[3] and others represent nodular lesions that have undergone varying degrees of healing. Many lesions formerly described by different workers are therefore the same, except for a different age pattern. Any fibroid or calcified lesion indicates age.[17] There are morphological characteristics which are prone to appear at different age periods.

At the other extreme of the chart is the non-resistant host with high sensitivity, invaded by large numbers of virulent bacilli; the result is an "exudative," rapidly progressive lesion that is prone to soften, ulcerate, spread rapidly to broncho-pneumonia, pneumonia, excavation and destruction of the lung tissue. If generalization has taken place, progressive soft yellow miliary lesions of Laennec are the result. The intervening space in the chart can be filled in with many permutations and combinations of variable factors, and every type of lesion ever described may be filled in.

As an example, Aschoff's bronchogenic acinonodose lesions range from small hard clusters to large soft infiltrates, similar in that respect to the hematogenous forms. On the one hand large slowly growing tuberculomas may form, and acute pneumonic infiltrates on the other. Assman's infiltrates and Reinhardt's caseous pneumonia are examples of exudation.

Thus it is possible to give a novel and modern explanation of Virchow's "dualism," which represents the two extremes just described, without his implication of malignancy. The author's concept may be considered as Virchow's dualism modified by Laennec's unity of cause. An additional feature is that there are a host of possible intermediate types between the two extremes.

By this system the motley pattern of tuberculous lesions can be visualized and better understood. In

the final analysis they are a resultant of two widely variable interacting biological agents modified by the aging of the lesions and the mechanical factors that sometimes enter in.

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Tuberculosis as a Cause of Upper Lobe Bronchiectasis

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SUMMARY

Bronchiectasis occurs frequently in association with pulmonary tuberculosis and is caused primarily by tuberculous bronchitis. It is common in all types of tuberculosis, especially in the fibroid lesion stage. It may occur with active tuberculosis and become part of the tuberculous picture. It may also occur with inactive tuberculosis and then present a distinct symptom complex. It is easy to diagnose. It is a relatively benign disease and usually no special treatment is needed; but when it becomes severe, pulmonary resection is the procedure of choice.

ALTHOUGH the coexistence of bronchiectasis and tuberculosis has been known since the time of Laennec, its importance was first stressed by Grancher[1] in 1878. He stated that bronchiectasis may appear in the course of fibrocaseous tuberculosis and be unrecognized because of the predominant symptoms of the tuberculosis, that it may occur in the course of fibroid tuberculosis and then produce a clinical entity, that it may develop as a sequel to inactive tuberculosis, and that tuberculosis may engraft itself on already developed bronchiectasis. And, although later French pathologists and clinicians gave excellent descriptions of the two diseases, little clinical interest was evoked until the introduction of lipiodol in 1920 by Sicard and Forestier, when bronchiectasis could be diagnosed anatomically.

Since that time a number of excellent reviews have been published on the clinical and pathological aspects of the two diseases. Nevertheless, there is still too little appreciation of the importance of the two coexistent diseases because the reports have been sporadic, because upper lobe bronchography is considered a difficult and trying procedure, and because of the fear of introducing iodized oil into tuberculous tissue. A review of the subject is now timely because the two diseases occur commonly, because they will occur more commonly as the lives of tuberculous patients are being prolonged, and because recent advances in chemotherapy and pulmonary resection necessitate a reevaluation of possible therapy.

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INCIDENCE AT AUTOPSY

Postmortem studies of the incidence of the two diseases are meager and indeed the incidence is difficult to determine. Unless specific dissection is made along the bronchi, even moderate dilatations will be missed, especially since only a segment of a lobe may be involved. Small dilatations may decrease in size when the lung is removed and escape attention. Osler[3] noted that it was "rare to dissect a lung in chronic ulcerative tuberculosis without finding somewhere a dilated bronchus, especially in the presence of fibrosis and most often in the upper lobe." Leber reported an incidence of bronchiectasis in 21 per cent of autopsies following death ascribed to tuberculosis. In 1941, Auerbach found bronchiectasis at autopsy in 37 (or 27 per cent) of 134 cases in which the patients had had thoracoplasty. Recently, Jones and co-workers[2] reported bronchiectasis in 46 of 100 autopsies, with a 19 per cent incidence in the presence of exudative disease and 65 per cent incidence in association with fibroid lesions.

In autopsy studies by the author dating back to 1934, a combination of postmortem bronchography and anatomical dissection along the bronchial tree was used. The present report deals only with definite cylindrical and saccular dilatations having a bronchial wall; despite their relationship to bronchiectasis, bronchial distortions, questionable dilatations, and linear caseous cavities which originally may have been bronchogenic are excluded. In a group of 124 patients, bronchiectasis was present in 58, or 45 per cent. The incidence relating to lobar location and pathological characteristics proved to be interesting.

The incidence of upper lobe bronchiectasis was determined in 200 lungs in which there were tuberculous lesions. In 82 lungs there was so much tissue destruction that almost all bronchi were obliterated and any previously existing dilatations erased. Bronchiectasis was present in 53 lungs — an incidence of 26 per cent for the entire group, or of 44 per cent of the bronchi visualized. The incidence was 22 per cent in exudative lesions, 16 per cent in caseous, 25 per cent in productive, and 35 per cent in fibroid. Computed on the basis of only the bronchi visualized, the figures would be 25 per cent, 34 per cent, 37 per cent, and 51 per cent respectively. A safe inference is that the incidence increases with the age of the lesion.

The incidence of lower lobe bronchiectasis was determined in 173 lungs in which there were tuber-

culous lesions. In only three lungs was there so much destruction of tissue that the bronchial status could not be determined. Bronchi were normal in 100 lungs, and dilated bronchi were noted in 70 lungs (40 per cent). The incidence of bronchiectasis in various stages of tuberculosis was follows: With exudative lesions, 15 per cent; caseous, 47 per cent; productive, 42 per cent; and fibroid, 61 per cent.

Combining the data for both upper and lower lobes, the incidence of ectasia with exudative lesions was 17 per cent; with caseous, 22 per cent; with productive, 34 per cent; with fibroid, 48 per cent. Since most of the omitted cases of extensive destruction were in the caseous and fibroid groups, the incidence of bronchiectasis may well have been higher at some time in the course of the tuberculosis.

In all but the exudative cases, the incidence of bronchiectasis in the lower lobe was higher than that in the upper lobe. The influencing factors include: (1) Increased stagnation of secretions in the lower lobe bronchi, with attendant increase in bronchial pressure and infection; (2) a greater pull on the diseased bronchi in the lower lobe. The lower incidence of bronchiectasis with exudative lesions in the lower lobe than in the upper lobe is explained in the fact that in many cases the tuberculous lesion was of recent origin and often preterminal.

Other observations as to incidence of bronchiectasis were: (1) It occurred more often in areas of dense confluent disease than in scattered nodular areas. (2) Except for healed fibroid regions, ectasia was most often found in areas surrounding cavitation. (3) Bronchial dilation was present in 18 of 20 cases of atelectasis.

CLINICAL INCIDENCE

There are no valuable clinical figures as to incidence of bronchiectasis, for all studies have been done on selected groups of cases. From anatomical studies it may be inferred that upper lobe bronchiectasis is quite common and, if the cases are selected properly, will be observed in a very high percentage of bronchographic studies. For example, with patients carefully selected for the procedure, bronchographic evidence of bronchiectasis has been noted in 50 cases in the past year in a 350-bed hospital. It was noted chiefly in patients with fibroid disease.

PATHOGENESIS

It is doubtful that true irreversible dilatation ever occurs in a normal bronchus. First there must be damage or weakening in the bronchial wall which then is further dilated by certain aggravating factors:

A. Weakened bronchial wall:
   1. Infection or neoplasm — with destruction of musculoelastic elements.
   2. Congenital deficiency of musculoelastic fibers.
   3. Degenerative and toxic atrophy.

B. Aggravating factors:
   1. Normal atmospheric pressure on a weakened bronchial wall under normal elastic tension.
   2. Increased pressure on the weakened wall:
      (a) Cough
      (b) Secretions (hydrostatic pressure and further infection)
      (c) Partial bronchial obstruction.
   3. Increased pull on the weakened wall:
      (a) High intrapleural pressure
      (b) Atelectasis—lobar or lobular
      (c) Scar tissue.

In tuberculosis the primary cause is tuberculous bronchitis with the aggravating factors playing a variable role. In the upper lobes there are relatively few retained secretions, while in the lower lobes such secretions play a prominent role. The associated pathological picture includes varying degrees of pneumonitis, fibrosis, atelectasis, and emphysema.

By serial bronchography and bronchoscopy the author has observed clinically the formation of bronchiectasis from tuberculous bronchitis in the lower lobes.[6] It was noted that there was mural infiltration of the diseased bronchus, swelling of the mucosa, and pronounced decrease in the size of the lumen, in some cases to the point of occlusion. Then, as healing occurred, the weakened bronchus became irregular and dilated (Figure 1).

SYMPTOMS AND SIGNS

In the presence of active tuberculosis the symptoms of bronchiectasis are overshadowed and are usually regarded as part of the symptoms of tuberculosis. The presence of bronchitis and bronchiectasis, however, undoubtedly adds to the symptoms of cough, expectoration, and hemoptysis.

In the presence of inactive tuberculosis, bronchiectasis produces a definite symptom complex. (The term "inactive" as here used means a healed lesion, no pulmonary cavitation, and sputum negative for tubercle bacilli by all methods.) In such cases the chief symptoms are cough, expectoration, and hemoptysis. The cough and expectoration are usually mild; most often hemoptysis takes the form of blood streaking, rarely brisk hemorrhage. Other symptoms, such as dyspnea, are part of the general picture—not related specifically to the local bronchial disease. If the bronchiectatic lesions are in the upper lobes, the amount of expectorated material is surprisingly slight in relation to the extent of ectasia. In most such cases it is less than an ounce daily. In about 75 per cent of the patients the amount of sputum is only about 10 to 20 per cent of the amount which would be expected if a similar degree of bronchiectasis were present in the lower lobes. Actually, the direction of bronchial drainage is more important than the lobar location of ectasia. If the dilated bronchus is above the level of the tracheal bifurcation, drainage is downward and therefore relatively little material is expectorated. The downward draining lesions are,

TUBERCULOUS BRONCHITIS PRODUCING BRONCHIECTASIS

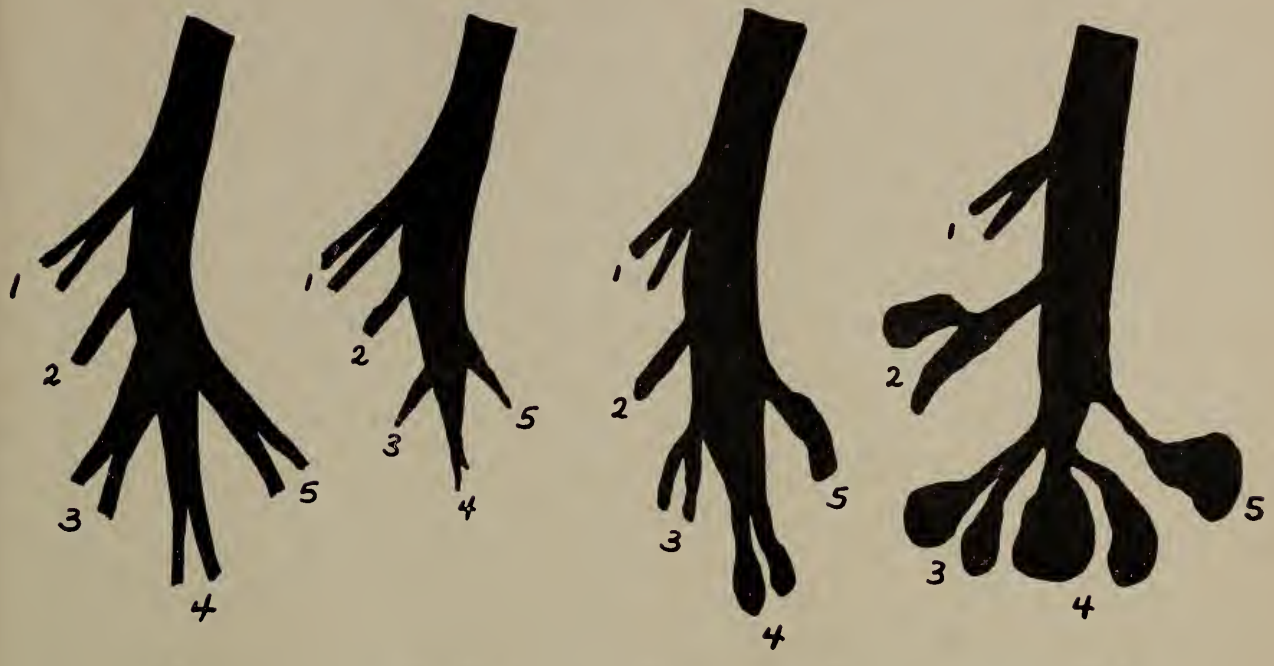

Figure 1.

for the most part, those in the upper lobes, although occasionally lesions in the apices of the lower lobes will drain downward. Patients with dilated bronchi which drain upward expectorate much more sputum. Upward draining ectatic lesions are those in the lower lobes, the right middle lobe, the lingular branch of the upper lobe, and even some in the anterior basal portions of the upper lobes. Abundant cough and sputum are indicative of bronchiectasis in the dependent portions of the lungs or of superimposed infection by other organisms than the tubercle bacillus.

In cases in which tuberculosis is approaching inactivity—that is, when cultures positive for the tubercle bacilli are the only indication of activity—the symptom complex of bronchiectasis is similar to that produced in inactive cases. However, an active tuberculous focus should be suspected. In the author's experience, sputum positive for tubercle bacilli is rare in the presence of bronchiectasis only.

The ectatic lesions may not be observable bronchoscopically, and the signs observable in physical examination depend upon the degree of tuberculosis present—pneumonia, cavitation, emphysema, and fibrosis. The most constant sign is the persistence of rales which have no specific diagnostic value.

RADIOLOGY

As observed bronchographically, the dilatations may be cylindrical, saccular, or of mixed structure. In extent they may be minimal, moderate, or widespread; in size, small, moderate, or large. Although some saccules may grow to large proportions, most are less than 2 cm. in diameter. They are usually grouped segmentally and have been described as resembling clusters of grapes, especially when the films are taken in the horizontal position, in which the iodized oil covers the dependent wall of the saccule; when the patient is erect, the oil drains into the bronchus and leaves only a film delineating the saccule. The saccules occur most often in the posteroapical branches. If bronchiectasis is suspected but no lesions are visible posteriorly, the anterior division of the upper lobe and the superior branch of the lower lobe also should be filled with the contrast material and examined.

Bronchiectasis may be suspected prior to bronchography if rarefactions with indistinct, thin, and indefinite walls (not over 2 cm. in diameter), located segmentally in groups or clusters, are observed in standard x-ray films. Often the pattern is "cloverleaf" with a narrowing toward the hilum. Rarely is collection of fluids observable. In roentgenographic appearance the frequently associated localized emphysema may simulate and even mask bronchiectasis. Oblique views and over-penetration techniques may emphasize some of these features. Especially valuable are planigraphic studies, which delineate the rarefactions to great advantage.

BRONCHOGRAPHY

For many years the author has successfully used a simple bronchographic technique.[4] Usually only a barbiturate is given the patient before bronchography; codeine and other narcotics are not used unless the patient has severe uncontrollable cough. Tetracaine hydrochloride in 2 per cent solution, butacaine sulfate, or cocaine is used for local anesthesia. Then an ordinary urethral catheter is passed into the trachea through the mouth or nose and the patient is put on a tilt x-ray table and fluoroscoped. (In lieu of a tilt table, an improvised Bradford frame, arranged so that the chest can be lowered, may be used.) Then, under fluoroscopic guidance, the upper lobes are filled by proper posturing: Rolling the patient on the right side with chest down to fill the right upper lobe, then having him lie prone to fill the anterior parts of the lobe. The lower and middle lobes may then be filled by placing the patient in the erect position. Both sides are filled at one sitting, since properly selected oblique views bring all the bronchi into relief without overlapping.

DIAGNOSIS

The presence of bronchiectasis can be diagnosed positively only by iodized oil bronchography. It may be suspected when the following features are present:

1. In active tuberculosis—more cough, sputum, and hemoptysis than expected.

2. In inactive tuberculosis—persistence of above symptoms. This is especially true of patients who have had thoracoplasty or pneumothorax.

3. Suggestive radiological appearance, especially in planigrams.

4. The presence of radiologically observable cavities with sputum negative or only occasionally positive for tubercule bacilli.

TREATMENT

In cases in which tuberculosis is active, treatment should be directed primarily at the tuberculosis. From the theoretical standpoint the presence of bronchiectasis should decrease the chances of successful pneumothorax or thoracoplasty by preventing maximum relaxation of the diseased area, but in the author's experience it has not been a common difficulty. In cases in which thoracoplasty is the preferred procedure, it should be done; but resection should be considered if the bronchiectasis is extensive, occurs in the lower as well as in the upper lobes, or is associated with stenosing bronchitis. If the bronchiectasis is only mild or moderate, pneumothorax is not contraindicated.

It should be remembered that bronchiectasis in association with inactive tuberculosis is a benign disease. However, if symptoms are severe (especially hemoptysis) resection is the only cure. Thoracoplasty or pneumothorax or other collapse measure may be of palliative value in controlling hemorrhage in cases in which resection is contraindicated. If there are recurring attacks of exacerbation of symptoms, considerable relief may be obtained by the temporary use of penicillin or aureomycin. Some patients who have abundant cough and sputum may obtain considerable relief by moving to a warm, dry climate.

It is to be expected that future therapy will be greatly modified by long term studies of the natural history of tuberculosis and bronchiectasis, by therapy, and by improved pulmonary resection.

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KEY TO ABBREVIATIONS USED

(Or.)—Original Article.
(Ed.)—Editorial.
(CMA)—California Medical Association
(CR)—Case Report.
(I)—Information.
(TB)—Tuberculosis and Health Association Supplement.

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